Report of
Hydrogeologic Investigation
Roppe Rubber Company
Fostoria, Ohio
August 6, 1987

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INTRODUCTION

Keck Consulting Services, Inc. (KCS) has been retained by Baker and Hostetler, legal counsel to Roppe Rubber Company (RRC), to conduct a hydrogeologic investigation at the RRC Fostoria, Ohio facility. The purpose of the investigation is to determine the hydrogeologic characteristics of the site and evaluate the existence of chlorinated hydrocarbons (USEPA Scan 601 compounds) in the soil and ground water.

The proposed work was initiated by the Remedial Investigation/ Feasibility Study (RI/FS) investigation being done by T. A. Gleason Associates for Allied Automotive and Union Carbide. Work done by T. A. Gleason at the Allied Automotive plant (north of RRC) indicated that chlorinated hydrocarbon contamination could be entering the Allied site from the south and southwest. A sample collected from RRC supply well #3, showed the presence of chlorinated hydrocarbons, particularly trichloroethene (TCE). Subsequent to these findings, RRC was identified as a potentially responsible party (PRP) and was asked to participate in the area-wide RI/FS investigation. Exhibit A was prepared by T. A. Gleason Associates and shows the areas of focus of the area-wide RI/FS. RRC is located within Area I.

RRC has advised KCS that TCE is not used in the current operations at the facility, however, concern about previous site occupation by Atlas Crankshaft (a division of Cummins) prompted RRC to conduct the assessment of their property.

BACKGROUND

This investigation has been prompted by a request for RRC to participate in a RI/FS aimed at identifying and evaluating chlorinated hydrocarbon sources, ground-water contamination plumes and remedial alternatives in the Fostoria, Ohio area. The Ohio Environmental Protection Agency (OEPA) has initiated the RI/FS on the basis of the results of four previous investigations in the Fostoria area, which addressed chlorinated hydrocarbon usage, contamination and remedial investigations.

The hydrogeological and ground-water quality investigation performed by T. A. Gleason Associates for Autolite Division, Allied Corporation, Fostoria, Ohio, February 6, 1986, is relevant to this investigation. Ground water sampled from on-site monitor and process-supply wells at the Autolite facility revealed the presence of chlorinated hydrocarbon concentrations ranging from 0 to 20,000 ug/l. On-site process-supply wells were found to be containing the contamination plume within the Autolite well field. Off-site domestic and industrial wells to the southeast and southwest of the Autolite facility sampled for chlorinated hydrocarbons revealed concentrations ranging from 162 to 20,700 ug/l. The primary contaminant detected in both the Autolite and off-site wells was TCE, a common industrial degreaser.

Only one well was sampled at RRC during the course of the Autolite investigation. We denote this well at Well #3 in our investigation. Well #3 is a 4-inch supply well and provides coolant water for manufacturing machinery at RRC. Chlorinated hydrocarbons were detected in Well #3 at a concentration of 879 ug/l.

Ground-water elevational data collected by T. A. Gleason during their investigation of the Autolite facility indicated that local ground-water flow was toward the purge system located in the southern area of their property. Their ground-water elevation data do not indicate the conditions under which these measurements were taken (i.e. pumping/non pumping status of area supply wells or on-site purge wells). The regional ground-water flow direction was reported to be northwesterly, however, local flow is controlled by the influence of pumping. The T. A. Gleason interpretation of flow was based on wells on the Autolite property and Well #3 at RRC. The implications from their interpretation of flow in conjunction with the 879 ug/l chlorinated hydrocarbons found in RRC Well #3 were that sources of the chlorinated hydrocarbons exist upgradient of the Autolite facility. The RRC facility was immediately upgradient of the Autolite well field based on this interpretation of ground-water flow.

PRELIMINARY INVESTIGATION

The initial phase of the hydrogeologic investigation was initiated in October, 1986. The work was performed in accordance with the September 24, 1986 Work Plan prepared by KCS. The purpose of this initial phase was to define the geology and ground-water quality at the three RRC supply wells and conduct a soil-gas survey of the site for identification of potential source areas for the chlorinated hydrocarbons.

Supply Well Logging and Sampling

The RRC wells were shutdown to accommodate the testing and during that time, city water was used for machinery cooling. The pumps were pulled from the wells to permit access.

A Keck SR-5000 continuous recording borehole logger was used to run natural gamma ray and electrical resistivity logs at the three wells. The logs are presented in Appendix A.

Ground-water samples were collected from each well while the pumps were removed. Since the wells had been used right up to the time of pump removal, only one additional well-volume of water was evacuated prior to sampling. The evacuation was done with a Keck SP-84 submersible sampling pump. Samples were collected with a teflon bailer, placed in 40 ml VOA vials and stored on ice until delivery to the laboratory. The laboratory analytical results are contained in Appendix B.

The top of casing elevations were surveyed on all wells from data provided by T. A. Gleason for Well #3 (which was included in the data set). Static water level measurements were taken from the three RRC wells and selected Autolite monitor wells. Autolite and T. A. Gleason personnel accompanied KCS personnel during the measurements. The ground-water elevation data is included as Appendix C.

Soil-Gas Survey

Soil-gas sampling locations were placed along the perimeter of the RRC property and at accessible areas of the interior of the property. The protocols that were followed are presented in Appendix D. The results of this work are contained in Appendix E. The soil-gas sampling locations and results are plotted on Exhibit B.

DATA INTERPRETATION

Geology

Surficial - The surficial geology is comprised primarily of clay-rich till. A portion of the surficial material at the site appears to be fill associated with construction. The unconsolidated materials on site cover the underlying bedrock surface and range in thickness from 2.5 to 8 feet without any particular areal pattern of vertical distribution. Evaluation of thickness was based on borings associated with the soil-gas survey and monitor well installation. At no time was saturation encountered in the glacial overburden during any of the phases of the investigation.

Bedrock - The consolidated strata immediately underlying the glacial mantle in the Fostoria area, including RRC, are dolomites and are categorized as the Lockport group within the Silurian System. These strata are collectively termed the Lockport Dolomite.

The Lockport Dolomite is economically important to both residents and industry because it is an excellent source of water and the most easily accessible aquifer system in the area. Studies by T. A. Gleason Associates indicate the Lockport group is 300 feet in thickness in the Fostoria area.

The bedrock structure is part of the Findlay Arch, an extension of the Cincinnati Arch separating the Michigan Basin to the north from the Appalachian Basin to the southeast. Fostoria is located near the crest of this Arch.

HYDROGEOLOGY

The source of RRC cooling water is from the Lockport Dolomite aquifer. Based on its hydrogeologic properties, T. A. Gleason

Associates interpret this carbonate aquifer as a diffuse flow type; hydrogeologic communication is expected to occur throughout the Lockport aquifer. A diffuse flow aquifer obeys or nearly obeys Darcy's Law of water movement in porous media; i.e. the velocity and discharge of water is directly proportional to the loss of head (potential) between the two points of travel.

Characteristics of a diffuse flow aquifer include: 1) a well defined water table; 2) a phreatic zone that is entirely saturated, i.e. both primary and secondary permeability contributes to the flux of ground water traveling through the aquifer; 3) Karst landforms (e.g. caves, sinkholes) are rare or absent in the region; 4) subterrainean cavities have a random spatial distribution, are relatively small and cannot be correlated in boreholes over appreciable distances; 5) the regional topography has low relief; and 6) the carbonate aquifer possesses high primary permeability.

Available data indicates that all of the above criteria are met within the Fostoria area and the Lockport aquifer.

T. A. Gleason Associates present a map of ground-water flow in the Lockport Dolomite (Figure 4) within <u>Work Plan, Description of Current Situation, and Support Documents, Fostoria Study Area, RI/FS</u>, dated April 11, 1986. This map is included for reference in our report and is denoted as Exhibit C. We have added an arrow to the map showing the location of RRC. The piezometric map is based on water level measurements taken from numerous residential and commercial/industrial wells, including RRC supply Well #3 denoted as C-4 on Exhibit C. According to the depiction on Exhibit C, regional horizontal flow of ground water in the Lockport aquifer is in a northerly direction. The concentric, semi-circular contours with decreasing elevations toward the centers represent ground water discharging to well fields.

Based on the data collected during this preliminary investigation, the following conclusions were reached:

1. An unconfined bedrock aquifer exists within the Lockport Dolomite beneath the RRC site to a depth of at least 150 feet below ground level (depth of deepest well on site). The water table occurs at approximately 19 feet below ground level.

2. Downhole geophysical logging of the three RRC wells suggests that the dolomite strata are free of formations (such as shale) that could restrict vertical migration of water in the aquifer.

3. Water samples from each of the three RRC supply wells showed the presence of chlorinated hydrocarbons with concentrations ranging from 6 to 2400 ug/l.

4. Non steady-state conditions prevail in the bedrock aquifer in the vicinity of the RRC and Autolite facilities and result from changing water demands placed on the aquifer as reflected by varied pumping rates in the well fields. As a result, the hydraulic gradient and direction of ground-water flow are subject to change.

5. The ground-water contour map (refer to Exhibit D) shows the flow direction to be northeast at the time of these measurements. Autolite well B-2 had been pumping up to the time of water level measurement, while water levels in the RRC wells reflect non-pumping conditions. The ground-water contours indicate the influence that withdrawal from B-2 has on the flow direction if the RRC wells are not pumping. The influence on hydraulic gradients from the RRC pumpage cannot be interpreted with the data collected to date.

6. Soil-gas sampling revealed chlorinated hydrocarbons (primarily TCE) at several locations about the RRC site and provided guidance for further hydrogeologic investigation. Soil-gas analyses south of mixing facility #2, the area east of the warehouse and manufacturing buildings and the area west of mixing facility #1, all indicated the presence of chlorinated hydrocarbons in the subsurface environment

(refer to Exhibit B). The first and third areas mentioned may be hydraulically upgradient of the RRC facility and suggested potential off-site sources of ground-water contamination.

Soil-gas analyses indicated relatively low concentrations (<80 ug/l) of chlorinated hydrocarbons (including TCE) suggesting that sources are farther upgradient. Generally, where soil contamination exists as a result of on-site activities, the concentrations would be expected to be much higher.

On the basis of these conclusions, KCS recommended the installation and construction of three monitor wells (MW's 4 through 6) at the RRC facility #2. The objectives of this work included: 1) evaluation of the possibility of chlorinated hydrocarbons migrating within ground water from an upgradient source onto the RRC site; 2) evaluating for potential on-site sources of chlorinated hydrocarbons contributing to ground-water degradation; 3) better define the ground-water flow regime within the bedrock aquifer; 4) evaluate any trends and changes in flow directions between the RRC and Autolite facilities associated with dynamic pumping conditions; and 5) evaluate and identify permeable zones within the proposed monitor wells.

The following presents the results and interpretations of this additional work.

FIELD WORK

Monitor Well Installation

A total of three monitor wells (4 through 6) were installed at the locations depicted on Exhibit E. Each well was installed to approximately 200 feet below ground level. This task was initiated on January 15, 1987 and completed on January 16, 1987 under the supervision of a KCS geologist. The wells were installed by Sever Well Drilling, Delphos, Ohio, using a truck-mounted, 1977, Cyclone air rotary drill rig. The upper 12 to 13 feet of each monitor well is constructed of 6 3/8-inch stainless steel surface casing. The stainless steel surface casing was fully decontaminated prior to installation in each boring. At each boring location, the upper 12 to 13 feet of borehole was drilled using a 9-inch roller cone bit. This depth ensured that competent bedrock was penetrated while the water table had yet to be encountered. At this point, the drill bit was retracted from the borehole and the surface casing was emplaced. A neat cement/bentonite slurry grout was added to the borehole and subsequently displaced from within the casing until the entire annular space was sealed. The boring was continued through the surface casing using a 6 1/8-inch air hammer bit. Since only competent bedrock was encountered beyond this point, the borehole was left uncased to total depth. Each well was completed with a vented, locking cap and lock.

At each boring, the drill cuttings were examined and logged by the geologist. Pertinent information including changes in lithology with depth, drilling penetration rate and total boring depth are recorded on the geologist's logs and presented in Appendix G.

Drilling water was required and stored in 55-gallon drums. Quality assurance samples were collected from the drums, packed on ice and later submitted to Ann Arbor Technical Services, Inc. of Ann Arbor, Michigan (ATS) for water quality analysis. The resulting data are included in Appendix H.

Prior to installation of each boring and upon final completion, all downhole drilling tools and pertinent equipment were thoroughly cleaned. The procedure included a high-temperature, high-pressure wash using a mixture of trisodium phosphate (TSP) and water followed by thorough rinsing with clean water. The back of the drill rig was also thoroughly washed. A Landa pressure washer was utilized in this task. Water was obtained from the municipal water system; samples of which were collected in 40ml VOA vials, packed on ice and later submitted to ATS for USEPA Scan 601 and 602 analysis. The procedures above ensured that cross contamination would not occur between borings.

A designated decontamination area was established in a paved area equipped with a manhole to receive runoff water. The area was located immediately west of the RRC maintenance garage.

Sampling Program

Ground-Water Sampling - Ground-water sampling of monitor wells 4 through 6 was conducted by KCS personnel on March 14 through 23, 1987.

The goals of the sampling program were to define the vertical concentration profile of any volatile organic compounds (including chlorinated hydrocarbons) at each monitor well location and to provide an estimation of the permeability of the portion of the borehole being sampled.

Each 200-foot monitor well was divided into eight to ten, five-foot sampling intervals, separated from one another by approximately 18 feet of borehole. This sampling regime was expected to delineate any vertical trend in chlorinated hydrocarbons within the aquifer while maintaining efficiency. Sampling and testing was started at approximately 190 feet below ground level in each well and progressed at approximately 18-foot increments in an upward direction. Exhibit F provides an illustrative description of the sampling system that was utilized. The sampling system was constructed of two-inch galvanized steel casing equipped with a leading, five-foot, #10 slot stainless steel well screen. Two inflatable Tigre-Tierra packers directly straddled the screen.

The sampling system permitted discrete, five-foot intervals of the borehole to be isolated by packing off the borehole above and below the screen at the desired sampling depth. Air was delivered to the packers via a nylon hose at a pressure approximately 125 psi, at least 30 psi in excess of the hydrostatic pressure at depth to ensure that the packers formed a tight seal against the borehole.

At sampling depth, the volume of water present in the two-inch casing and the 8-inch by 5-foot borehole were calculated. The resulting volume was multiplied by five to determine the required amount of water to be purged prior to sampling. The required volume of water was purged from the well with either a deep well jet pump or a KCS SP-81, two-inch submersible pump. The intake settings of the pumps were set as close as possible to the dynamic water level, within the two-inch well, to ensure complete removal of all standing water within the well. Purging ensured that the sample to be collected would be representative of ground-water quality. The pumps and attachments were thoroughly decontaminated prior to use in each well.

Ground-water samples were collected with a 1 3/4-inch O.D. by 24-inch stainless steel bailer equipped with a check valve. The bailer was attached to reeled, stainless steel cable. Following purging of the well, several bails of water were removed and discarded prior to sample collection. The ground-water sample was then collected by lowering the bailer to the screened interval to ensure the sample was fresh and representative. The sample was poured directly from the bailer to the sample vial.

Two samples were collected at each sampling depth. All samples were placed in 40ml, VOA vials with teflon septums supplied by ATS. Prior to sample collection the set of VOA vials were properly labeled with job name, date, time, well identification and depth interval. Post collection, each sample set was placed in a unique plastic bag and stored in a cooler at 4°C. The sample set was then recorded on the chain of custody form. The samples were later submitted to ATS for analysis. The resulting data is included in Appendix H.

Quality Control/Quality Assurance

To prevent cross contamination between samples, each piece of sampling equipment was thoroughly decontaminated prior to each use. Periodically, samples of rinse water were collected via the sampling bailer and submitted for analysis to maintain quality control. The resulting data is included in Appendix H.

Quality control was assured by use of neoprene gloves whenever handling sampling materials. Additionally, sampling equipment was always placed on clean, disposable, plastic sheeting.

All sampling equipment and materials were thoroughly decontaminated prior to use at each monitor well. The decontaminating process included a high-temperature, high-pressure, TSP wash, followed by a clean water rinse. The Fostoria municipal water supply served as the water source for this task.

In-Situ Hydraulic Tests

Following ground-water sampling at each interval, an in-situ, hydraulic conductivity test was performed. The falling head or "slug test" method was utilized. Teflon rods, equivalent to a volume of one gallon, were used to induce the rise and fall of the water level within the two-inch well. Envirolabs EL-2000 ground-water monitoring system with a model DL-120-MLP data logger were used to record the water level changes versus time. This system is connected to a pressure transducer which was lowered into the well prior to hydraulic testing. The pressure transducer and cable were thoroughly decontaminated after each use. The resulting data are presented in Appendix I.

The "slug test" method was preferred over the "pressure permeability" test method because it was not necessary to continually add large volumes of water to the well and formation surrounding the packed off interval. Addition of large quantities of water increases the possibility of biasing ground-water quality at specific sampling intervals.

Well Development

The bedrock wells were developed concurrently with installation by the air surging method. Air delivered to the bit provided the mechanism necessary to cause a surging action in the open borehole above.

Level Surveying

An elevational survey was conducted by KCS personnel to determine the top of casing elevation of the new RRC monitor wells. Top of casing elevation of RRC Well #3 had previously been surveyed relative to USGS datum during the Autolite investigation. KCS tied in the monitor wells to well #3.

Geophysical Logging

Natural gamma-ray, electrical resistivity and borehole caliper logs were run to the total depths of each of the three monitor wells using a Keck Geophysical Instruments SR-5000 continuous borehole logger. The resulting logs are presented in Appendix J.

Prior to use at each boring, all downhole instruments and attachments were thoroughly decontaminated to prevent cross contamination of the wells.

RESULTS AND ANALYSES

Geologist's Logs

Each of the three monitor wells (MW's 4 through 6) were installed 200 feet below the top of surface casing elevation (btoc). The geologist's logs (Appendix G) confirm the presence of carbonate lithology to a total depth of 200 feet (btoc) and the absence of any confining layers within the sequence (e.g. shale). As noted on the logs, the drill cuttings often exhibited a porous, crystalline (sparry) texture which is characteristic of a diffuse flow type aquifer. Secondary permeability was noted on a few occasions when the drill rod dropped freely over a short distance (1 to 2 feet) indicating the presence of solution cavities. Penetration rates recorded on the logs indicates the time required to drill the denoted borehole interval.

Geophysical Logging

Natural gamma-ray, electrical resistivity and caliper logs were run to the total depths of each of the three RRC monitor wells using a Keck SR-5000 continuous borehole logger. The logs are presented in Appendix J. The upper portion (approximately 20 feet) of each monitor well could not be tested for resistivity since this test requires a saturated, uncased borehole.

The objectives of the logging included: 1) identification of geologic material; 2) locating, if possible, permeable/impermeable zones in the dolomite; and 3) provide a means for correlating formations in the six, on-site wells, if the hydrologic and geologic properties warrant their separation.

The natural gamma-ray and resistivity logs corroborate the geologist's logs for MW-4. Relatively high counts per minute (cpm) (up to 440 cpm) on the gamma log in the upper 3 feet of the boring, suggest clayey soils at that interval, which were encountered during drilling. The charts have signatures indicating relatively pure carbonate lithologies to the total boring depth (low gamma counts, high resistivity). The caliper log for MW-4 indicates that the boring has a consistent diameter of about 8 inches in the uncased zone. Two cavities are readily apparent at the intervals of 55 to 57 feet and 88 to 90 feet. The upper cavity was noted during drilling operations. Lower resistance in the upper 60-foot portion of the log suggests a greater volume of water per unit volume of rock, indicating higher permeability relative to the formations at increasing depth.

distributed with depth. The cavities appear unique to each borehole. One will recall that lack of a well developed network of subterrainean channels is typical of a diffuse flow type aquifer.

The jagged appearance of the caliper logs at certain depths within the three boreholes may represent bedding planes that are more subject to enlargement by dissolution. These cavities, however, are only in the juvenille stages of development and are not expected to exert structural control on ground-water flow, i.e. impose semi-confining conditions.

Falling-Head Permeability

Permeability profiling was conducted in MW's 4 through 6. The falling head or "slug test" method was utilized. The method of testing is discussed in the field work portion of the report. The goal of permeability testing included: 1) to determine the permeability of the isolated formation interval for latter comparison to its water quality; 2) evaluate the degree of spatial variability of permeability of the formation in each borehole; and 3) to identify any systematic trend of permeability with depth.

The resulting data was analyzed using the Hvorslev method as described in Groundwater, p. 340, by Freeze and Cherry, 1979. As with any "in-situ" permeability test, the results measure how well the borehole is coupled with the aquifer. The results not only reflect the relative permeability of the formation, but also may be affected by "skin" damage experienced by the formation during drilling of the borehole. Thus, permeability values are only estimates of the packed off borehole interval tested and should be regarded as such. A table of the calculated permeabilities of the intervals tested in each borehole is presented in Appendix I. The values were calculated using recovery data from the tests.

Eight to 10 zones were tested in each borehole. Relatively large cavities noted on the caliper logs were intentionally avoided due to potential problems with sealing off these voids with the packers. One should bear in mind that these larger cavities may be high water transmitters on a local scale and, as such, would possess high permeabilities.

A total of 8, 5-foot zones were tested in MW-4. The resulting permeabilities range from 0.3 ft/day to 52.8 ft/day at 148 to 153 feet below ground level and 76 to 81 feet below ground level, respecti.ely. These are the extreme values noted in all of the test intervals for each of the monitor wells.

The permeability values noted in each borehole are highly variable and do not exhibit a strong pattern of vertical distribution. However, the aquifer at each of the monitor wells do appear to be more permeable in the upper 120 feet.

This makes sense because the upper portion of the aquifer would have been exposed to more weathering prior to deposition of the glacial mantle. Solution cavities are evident above 120 feet on the caliper logs.

The permeability test results indicate extreme spatial variation of permeability in the formation (heterogeneity) both horizontally and vertically. In addition, at any one point in the formation the degree of permeability will vary with direction (anisotropic conditions). Although the entire aquifer is saturated, indicating both primary and secondary permeability, the amount of water transported in the secondary openings (joints, fractures, bedding partings) is expected to be much greater (on the order of magnitudes) than that transmitted in the zones of primary (intergranular) permeability. Zones of primary permeability generally produce only a few gallons per minute when pumped. These porous zones do serve an important function of supplying the secondary openings with water as it is withdrawn by a pumping well.

Water Level Measurements

One of the goals of installing the RRC monitor wells was to better define the ground-water flow regime on site during periods of pumping from the 3 RRC supply wells and during non-pumping conditions.

A series of water level measurements were taken in March, 1987 to accomplish this objective. Ground-water elevation contour maps were constructed representing pumping and non-pumping conditions.

Exhibit G, constructed from data in Appendix K, collected on Sunday, March 22, 1987, represents the water table when the RRC supply wells were inactive. The arrows on the map represent the direction of horizontal flow component in the aquifer beneath the site. It is evident that the ground water is flowing in a northwesterly direction onto the southern portion of the site in the vicinity of MW-5. MW-5 possessed the highest hydraulic potential of all of the on-site wells with an elevation of 747.64 feet above mean sea level.

This site-specific depiction of ground-water flow during non-pumping of RRC supply wells is in general agreement with the larger scale picture of flow in the Lockport aquifer constructed by Gleason Associates (refer to Exhibit C). The center of the drawdown cone in Exhibit C exists around the Autolite supply wells. It is our understanding that a supply well is being continuously pumped at the Autolite facility to contain on-site chlorinated hydrocarbons. According to Exhibit C, when the RRC well field is inactive, ground water entering the RRC site will flow toward and discharge to the Autolite supply wells. This is likely, but cannot be determined with the available data from the RRC wells.

The higher hydraulic potential noted in Well #1 than in MW-6 may be attributable to a greater amount of drawdown experienced at MW-6 due to pumping in the Autolite well field.

During the investigation in March, 1987, the 3 RRC supply wells were pumping on Monday through Friday, 24 hours per day, with an average combined pumping rate of 172,000 gpd (Well #1- 52,600 gpd; Well #2 - 73,800 gpd; Well #3 45,600 gpd). Water level measurements were made in each of the 6 RRC wells during pumping periods. The data are presented in Appendix K.

A ground-water elevation contour map (Exhibit H) was constructed from a complete round of water level measurements taken while all of the RRC supply wells (1, 2 and 3) were pumping. Examination of Exhibit H shows that ground water is flowing onto the RRC site at the southern and western perimeters of RRC property and eventually discharging to the RRC wells. This statement is supported by drawdown observed in MW-5 and MW-4 relative to non-pumping conditions and increased gradient or slope of the water table toward the RRC supply wells. The flux of ground water through the aquifer beneath the RRC site will obviously increase from non-pumping to pumping conditions.

Exhibit H shows MW-6 to possess a higher hydraulic potential than the 3 pumping supply wells. In addition, 2.44 feet of drawdown is experienced at MW-6. These two facts indicate that ground water is flowing from MW-6 toward the RRC well field.

It is difficult to determine the radius of influence of the RRC supply wells in the direction of the Autolite facility. The radius of influence, delimits the outer extent of the cone of depression, usually defined at 0.01 feet of drawdown. All of the flow lines within the radius of influence converge at the pumping well(s). This case is complex for several reasons:

1. Three RRC supply wells are causing mutual interference, i.e. additional drawdown is experienced in each pumping well from withdrawals from the other two wells. The cones of depression overlap one another. Where they overlap, the observed drawdown is the algebraic sum of the individual drawdown cones at that location; turbulence associated with pumping also causes additional head loss.

2. Intermittent pumping is occurring in the Autolite supply well, B-2, causing non-steady state conditions.

3. The aquifer is extremely heterogeneous making the application of theoretical flow equations in porous media extremely tenuous.

4. The cones of depression from the RRC and Autolite supply wells are mutually interferring and are certainly dynamic in space and time.

When two or more cones of depression overlap, ground-water divides occur. Flow to individual wells is controlled by the location of the hydraulic highs within the interferring cones of depression. The only way to delineate these features under such conditions is empirically, using monitor wells and determining respective water levels during semi-steady state conditions.

An elevation of approximately 727 feet above mean sea level in Well #2 during pumping is approximately 9 feet lower than the pumping levels (736 feet) indicated on Exhibit C representing the pumping levels in the Autolite wells. In addition, KCS measured the water levels in a number of Autolite monitor wells, Autolite supply well B-2 (permission was granted by Autolite management) and the 3 RRC supply wells on October 16, 1986. The water level in Autolite supply well B-2 was measured immediately after it had been pumping and exhibited an elevation of 736.66 feet. The correction for the seasonal variation of the water table can be estimated from the two non-pumping levels noted in RRC Well #3 on October 15,1986 (744.17 feet) and March 22, 1987 (744.14 feet); the difference is negligible.

If we assume similar transmissivities at the Autolite and RRC sites, and assume that the pumping levels in the wells represents the water levels in the aquifer surrounding the wells, then a hydraulic potential would exist for ground water to flow from the Autolite facility to the RRC well field. If the assumptions above are accurate, then the potential exists for chlorinated hydrocarbons within the plume at the Autolite site to migrate with ground water onto the RRC facility when the RRC wells are active. This process would be enhanced whenever Autolite well B-2 is inactive while the RRC wells are pumping. KCS was unable to measure water levels in the Autolite wells during the most recent phase of work.

WATER QUALITY RESULTS

Water samples were collected from MW's 4, 5 and 6 during the latter part of March, 1987. The methods used are described in the field work section of the report. All water samples, including field blanks, were analyzed for USEPA 601 and 602 parameters by ATS. The resulting data are presented in Appendix H. The detection limit for the parameters is less than 1 ug/l. The resulting data are denoted by well identification number and the sampling interval relative to top of surface casing (TOC) elevation.

It will be recalled that MW-5 is located hydraulically upgradient relative to the other 5 wells at RRC. The sampled intervals spanned from the top of the aquifer (25 to 30 feet btoc) to nearly the bottom of the borehole (192 feet btoc). All 10 samples revealed significant levels of chlorinated hydrocarbons, primarily TCE. TCE concentrations ranged from 1400 ug/l in the 61 to 66-foot sample to 1900 ug/l in the 25 to 30-foot sample. The 1,2-dichloroethene (1,2-DCE) concentrations ranged from 210 ug/l to 380 ug/l and were detected in each of the intervals sampled. Tetrachloroethene (PCE) was detected in each of the samples at low levels (1 to 2 ug/l). 1,1,1-Trichloroethane was also detected at low levels (2 to 4 ug/l) in 8 of the 10 samples from MW-5. The mean TCE concentration in MW-5 was 1720 ug/l with a standard deviation of 140 ug/l.

The highest concentration of chlorinated hydrocarbons in MW-4 were detected in the 25 to 30-foot interval at 160 ug/l TCE and 36 ug/l 1,2-DCE. Due to the presence of solution cavities, samples were not collected at the 60 and 100-foot intervals because of potential problems with sealing off the voids at these depths. Chlorinated hydrocarbons were not detected in the 133 to 138 and 151 to 156-foot intervals and at low levels below these intervals.

Sampling of MW-6 showed the presence of chlorinated hydrocarbons in each of the sampled intervals (refer to Exhibit I). TCE concentrations ranged from a maximum of 1800 ug/l in the 112 to 117-foot interval to a minimum of 500 ug/l in the 148 to 153-foot interval. PCE was detected at low levels (2 to 4 ug/l) in the 94, 112 and 130-foot sampling intervals. The mean concentration of TCE was 959 ug/l with a standard deviation of 442 ug/l.

Exhibit I was constructed to illustrate water quality versus permeability and depth in each of the 3 monitor wells. As can be observed, chlorinated hydrocarbons are present in the ground water at each of the monitor well locations.

Quality assurance samples of the wash and rinse water used to decontaminate the sampling bailer were collected periodically via the bailer. In addition, a sample of the municipal water used in the decontamination process was collected. The results of the bailer blanks only showed the presence of chloroform and bromodichloromethane at concentrations in the 40 to 50 ug/l and 10 ug/l range, respectively. The source of the parameters is the municipal which showed the presence of

52 ug/l chloroform and 9 ug/l bromodichloromethane. These trihalomethanes are probably by-products of chlorination of the surface-water supply (Fostoria uses both surface water and ground water). Methane occurs naturally in surface water supplies.

Chloroform was detected in a water samples from MW-4 at low concentrations (<10 ug/l). It is uncertain if the chloroform is truly representative of the ground-water quality or attributable to rinse water used for decontaminating the bailer. Chloroform, however, was not detected in water samples from MW-5 and MW-6.

DRILLING WATER RESULTS

Drilling of monitor wells required the addition of water through the drill rod from a surface source. The drilling contractor arrived on site with enough water to complete MW-5. A sample of the water was collected and analyzed by USEPA 601 and 602 methods; none of the parameters were detected. Drilling water for MW-4 and MW-6 was supplied by the municipal water supply. A sample from the municipal water supply (denoted as supply water) showed the presence of 40 ug/l chloroform and 4 ug/l bromodichloromethane. As expected both of these parameters were detected in the samples of drilling water used for the installation of MW-4 and MW-6. The small quantity of municipal water added to the borings during installation is not expected to have any impact on ground-water quality; all of the water added was flushed from the borings during air development.

SOIL QUALITY

During the monitor well installation program, several surface soil samples were collected from the RRC site at the locations shown on Exhibit J. The soil samples were analyzed for USEPA 601 and 602 parameters. The resulting data are presented in Appendix F.

Soil sample #5 represents a composite of drill cuttings and underlying soils adjacent to MW-5. The sample was collected during installation of MW-5. Soil sample #5 was the only sample in the vicinity of MW-5 to show the presence of any of the parameters (2 ug/kg TCE). The low TCE level is most likely due to residual on the drill cuttings since fairly high levels were encountered during installation of the boring.

A surface soil sample collected in the vicinity of MW-6 (soil sample #6) showed the presence of 1 ug/kg benzene. Composite samples of drill cuttings were collected from 0 to 15 and 13 to 16 feet. These samples did not show the presence of any of the parameters.

DISCUSSION

Previous studies by Gleason Associates identified a chlorinated hydrocarbon plume southeast and hydraulically upgradient of RRC that falls within the cone of influence which is partially induced by the RRC well field. This plume is a potential source of chlorinated hydrocarbons observed in MW-5 and the other RRC wells.

The available water quality and water elevation data indicate that a chlorinated hydrocarbon plume is crossing the southern property line of RRC in the vicinity of MW-5 and entering onto the RRC site. As depicted on Exhibit I, the plume is vertically distributed throughout the aquifer. Exhibit I also shows the calculated permeability values of the sampled intervals. It is evident that a systematic relationship does not exist between the vertical distribution of chlorinated hydrocarbons and relative permeability of the formation.

Hydraulic mechanics of the site suggest that the plume is traveling onto the RRC site from the south when the RRC wells are inactive (Exhibit G). The flow direction in the vicinity of MW-5 is in concurrence with the direction of regional flow as defined in studies conducted by Gleason Associates. The regional gradient is apparently increased due to pumping of the Autolite wells.

The contaminant plume appears to extend horizontally from MW-5 to MW-4. The plume exhibits lower concentration levels in MW-4 and appeared to be present in the upper 120 feet of the aquifer at the time of sampling. One should bear in mind that concentration levels of chlorinated hydrocarbons observed in each well will vary in space and time due to migration of the plume with groundwater flow; sampling of the wells represents a "snap shot" of the portion of the plume present at the sampling point.

Pumping of the RRC supply wells increases the hydraulic gradient in their direction thereby increasing the velocity and flux of the on-site plume through the aquifer (refer to Exhibit H). The radius of influence of the RRC wells appears to extend beyond MW-5 as indicated by a difference of head of 0.19 feet between pumping and non-pumping conditions (March 15 and 22, 1987). Thus, pumping of the RRC wells may accelerate migration of the plume from upgradient.

The presence of chlorinated hydrocarbons in MW-6 in conjunction with the directions of ground-water flow depicted on Exhibit H suggest that chlorinated hydrocarbons may be entering the RRC site via ground water from the Autolite site. Verification requires additional water elevations in monitor wells at the Autolite facility. As depicted on Exhibit I, the chlorinated hydrocarbons are distributed to at least 190 feet in MW-6.

Highest concentrations of chlorinated hydrocarbons in the 3 monitor wells occurred in MW-5 at the time of sampling. This fact suggests that the source of the chlorinated hydrocarbon plume at the RRC site is from an upgradient, off-site source.

In an effort to evaluate chemical characteristics of the chlorinated hydrocarbon plume, the ratio of 1,2-DCE to TCE concentration for each sampled interval within MW-5 was calculated. This method serves to "fingerprint" the plume at MW-5 and provides a comparative characteristic at the other RRC wells. If the plume is from one, off-site source, then the chemical concentration ratios should be similar in each of the monitor wells.

Recall that we did not sample Well #3 during this phase of the investigation and it exhibited the highest chlorinated hydrocarbon concentrations of the 3 supply wells in October, 1986 with 2400 ug/l TCE and 300 ug/l 1,2-DCE. If the plume observed in Well #3 in October, 1986 is from the same upgradient source(s) observed in MW-5, then the chemical ratios would be very similar.

The 1,2-DCE/TCE ratio for the sampled intervals in MW-5 averaged 0.14 with a population standard deviation of 0.04. The ratio calculated for Well #3 is 0.13. The resulting ratios are extremely close, indicating the same source(s) of chlorinated hydrocarbons, thus indicating that the chlorinated hydrocarbons in Well #3 are also from an off-site source.

The average 1,2-DCE/TCE ratio for MW-4 is 0.18 with a population standard deviation of 0.04 while that for MW-6 is 0.10 with a standard deviation of 0.01. All of these ratios are very similar and suggest an off-site source.

If an on-site spill of TCE had occurred in the vicinity of MW-5, then we would expect to see: 1) high soil-gas concentrations of TCE; 2) 5 to 10 percent of the solubility of TCE - approximately 55,000 to 110,000 ug/l - in the ground water; and 3) soil contamination. None of the above were observed in the vicinity of or in water samples collected from MW-5.

CONCLUSIONS

The following conclusions have been drawn from the data collected to date:

1. The monitor wells recommended in the December 8, 1986 KCS hydrogeologic report have been installed and comply with the specifications outlined by T. A. Gleason.

2. The aquifer is under water table conditions and exists in the Lockport dolomite to depths of at least 200 feet below the surface. There are no confining beds on the site that vertically separate the flow within the aquifer.

3. The formation permeability varies vertically and horizontally throughout the RRC site.

4. The water quality results show that contaminants are contained throughout the entire aquifer penetrated for the monitor wells. This confirms that there is vertical hydraulic communication through the aquifer.

5. The upgradient well (MW-5) contains high concentrations of chlorinated hydrocarbons and at no time was this well hydraulically downgradient of the RRC facility. The source of contaminants in this well appears to be upgradient.

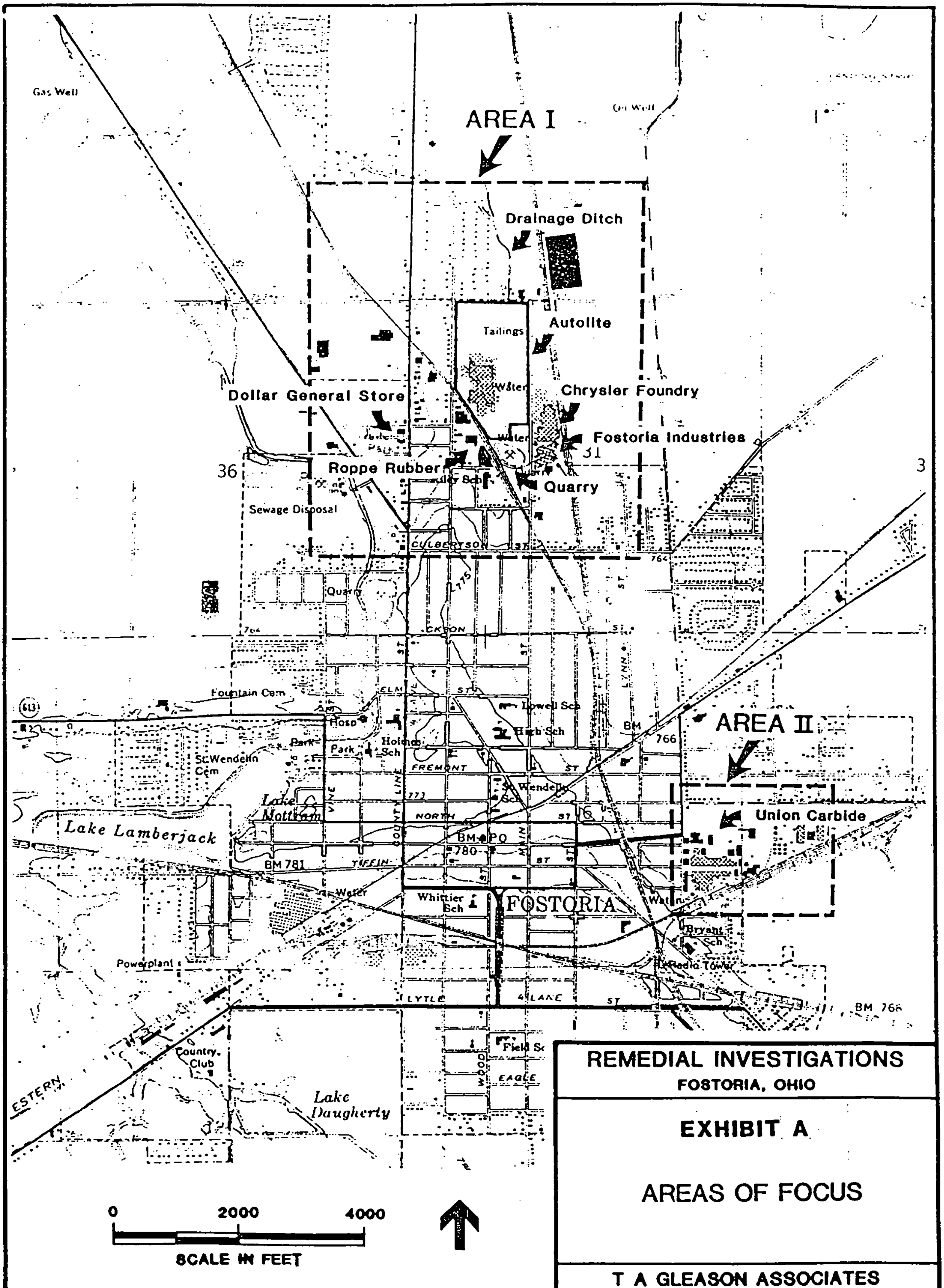
6. Due to the variable pumping at the RRC facility, the hydraulic gradient at the RRC site changes. During the time (5 days per week) that pumping occurs at RRC, the hydraulic gradient appears to be from the Allied facility toward the RRC site. Therefore, the potential exists for contaminants to migrate to the RRC site. This cannot be confirmed with the data available.

7. The data collected to date on the RRC site do not indicate on-site sources of contamination. The ground-water contamination that is present in the aquifer under the RRC site appears to be entering from the south, southeast and may have some contribution from the east due to the flow direction created by the pumping of the RRC wells.

8. The contamination plume has apparently existed for many years and specific sources have not been defined. Due to the various, historical ground-water withdrawals in the area, the migration path(s) cannot be determined with the existing data. It is known that many of the manufacturing facilities in the vicinity of RRC have required cooling or process water. The following local businesses have in the past used water for manufacturing:

   a. Fostoria Industries - Ground-water source
   b. Chrysler Foundry - Surface water from quarry east of RRC. Water was recycled for cooling purposes.
   c. Autolite - Ground-water source
   d. RRC - Ground-water source

   The volume of water used by these industries in the past is not known. Based on the current knowledge of flow direction relative to pumping at Autolite and RRC, flow directions in the past may have been much different that



REMEDIAL INVESTIGATIONS

FOSTORIA, OHIO

EXHIBIT A

AREAS OF FOCUS

T A GLEASON ASSOCIATES

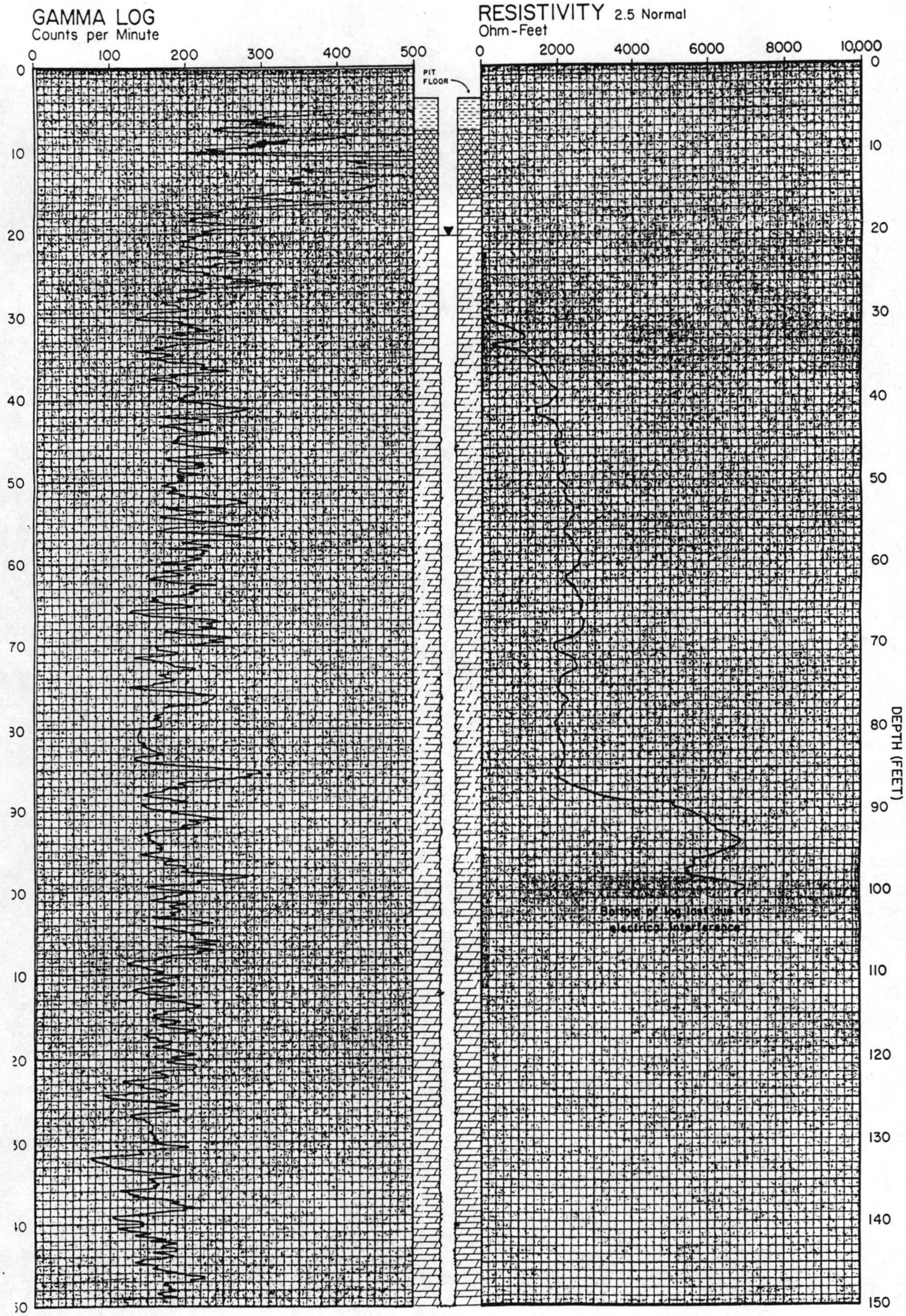
A4463

Appendix A

Geophysical Logs - RRC Supply Wells

WELL No. 1

Roppe Rubber Corporation
1602 N. Union Street
Seneca County, Fostoria, Ohio

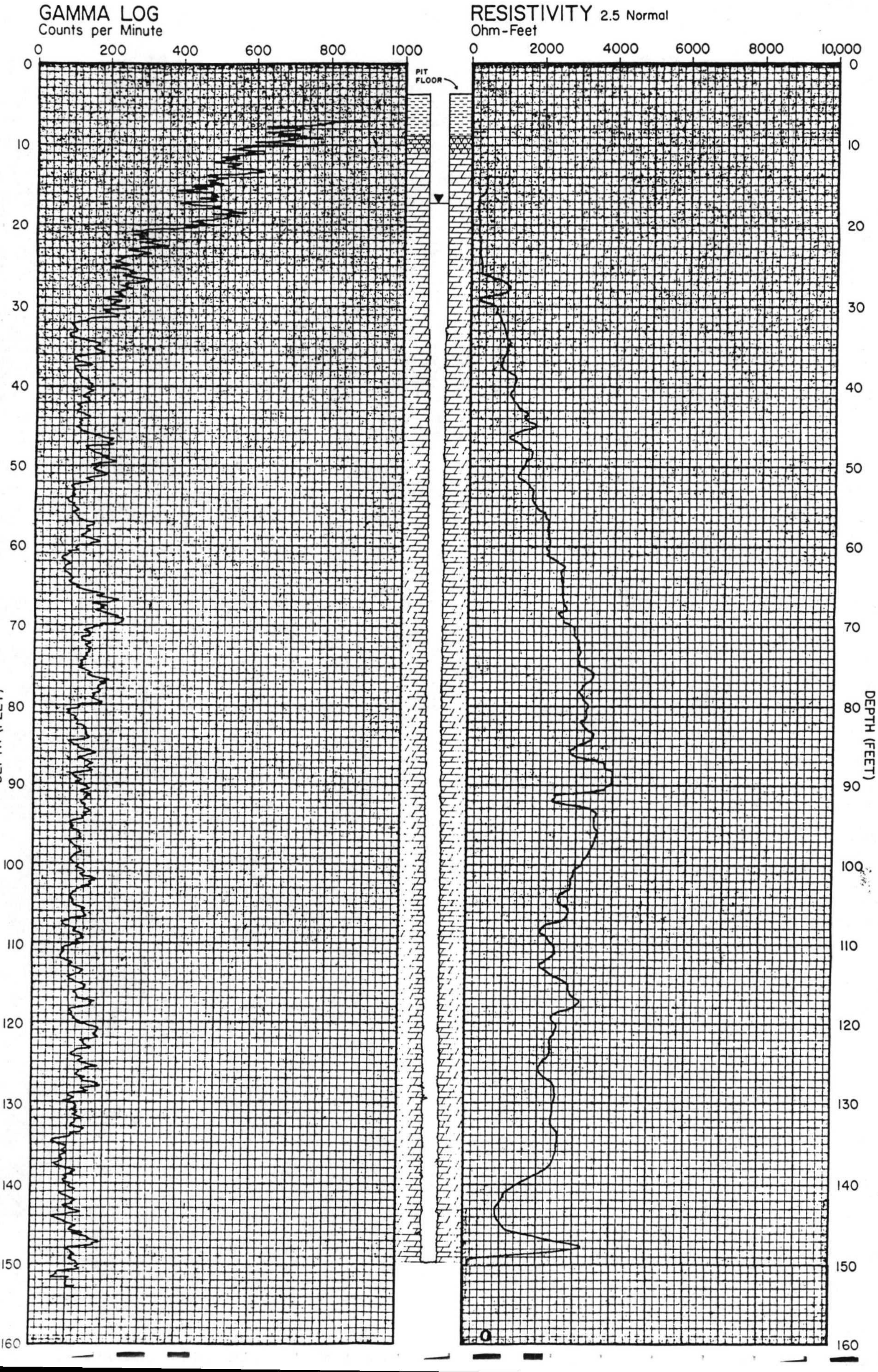


/4/86

KECK consulting services, inc.

WELL No. 2

Roppe Rubber Corporation
1602 N. Union Street
Seneca County, Fostoria, Ohio

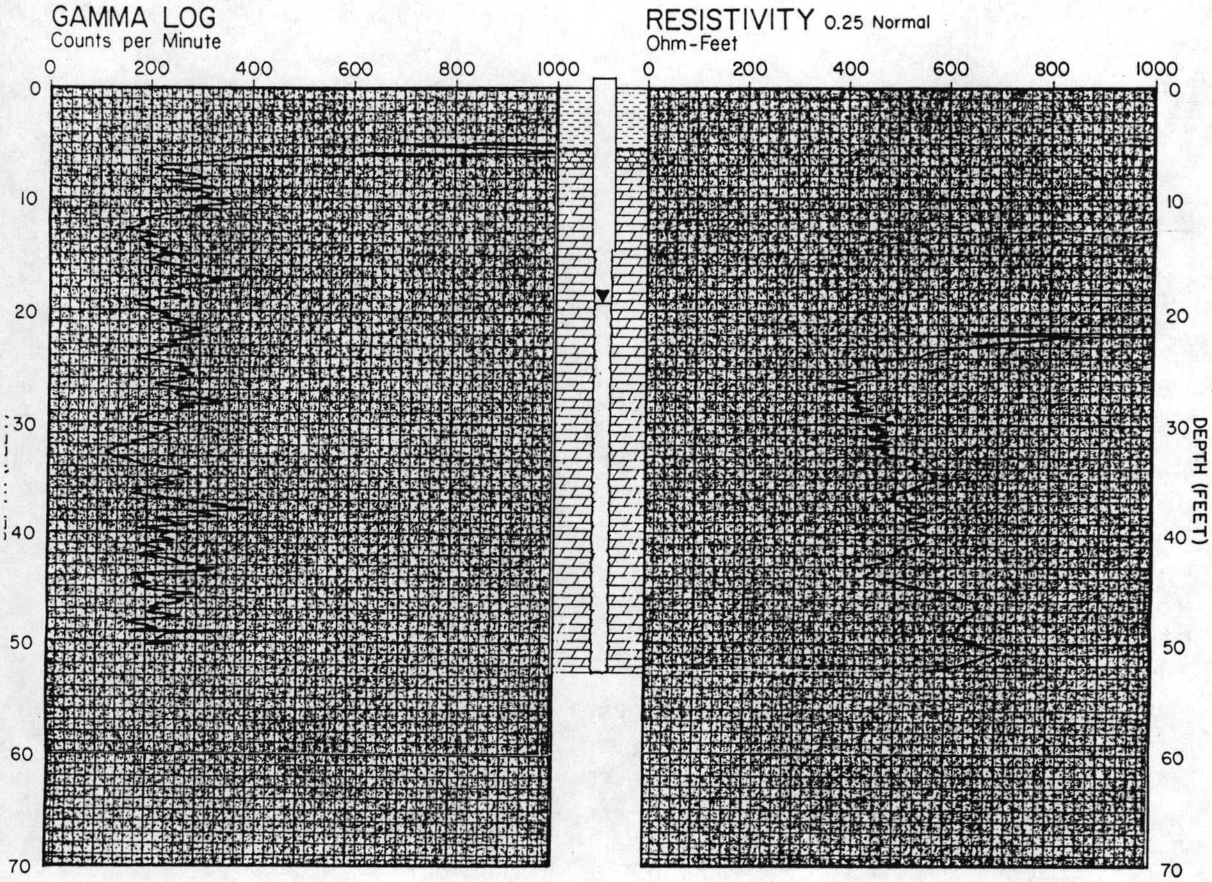


WELL No. 3

Roppe Rubber Corporation

1602 N. Union Street

Seneca County, Fostoria, Ohio



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Appendix B

Water Quality Analytical Results
October, 1986

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date October 28, 1986

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample Roppe Rubber #1

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date October 1986

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.086	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.71	0.001
MDNR Organic Scan II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date October 28, 1986

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample Roppe Rubber #2

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date October 1986

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.12	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.006	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.036	0.001
MDNR Organic Scan II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Ann Arbor
Technical Services, Inc.
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Date October 28, 1986

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample SW (Well #3)

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date October 1986

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.30	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	2.4	0.001
MDNR Organic Scan II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Appendix C

Ground-Water Elevation Data Table
October, 1986

DATE October 16 & 17, 1986 **PROJECT** #0036-1655 Roppe Rubber

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
#1-126			765.46	19.35	746.11
#1-322			766.58	21.07	745.51
#5-130			763.02	22.11	740.91
#5-317			763.59	22.66	740.93
#9-307			761.96	15.75	746.21
#1			762.41	20.59	741.82
#2			761.72	17.20	744.52
#3	762.70	0.79	763.49	19.32	744.17
B-2			761.94	25.28	736.66

KECK consulting services, inc.

Appendix D

Soil-Gas Protocols

PROTOCOL FOR SOIL GAS ANALYSIS

The analysis of soil gas for organic constituents requires the collection of a representative sample followed by accurate, precise detection. Because many variables are involved in the process, Keck Consulting Services, Inc. has developed a precise analytical protocol to minimize the influence of these variables.

The detection component of the technique is accomplished using either a Photovac 10A10 or a AID 210 portable gas chromatograph (GC). Each instrument is designed to provide detection based on the operation of chromatographic separation techniques and the differential photoionization potential of organic compounds. The sample is injected into a nitrogen gas stream which carries the sample through a column packed with a porous solid coated with a stationary liquid phase. The volume provides a surface which attracts and adsorbs molecules. The extent of attraction and retention is determined by the size and polarity of the molecules, and the liquid solvent. As a result of these differential attractions and retentions each organic compound completes passage through the column at a different reproducable rate. Thus, this process functions to effectively separate each compound within the gas stream.

As the sample stream is eluted from the column it enters a detector chamber. An adjacent ultraviolet lamp emits photons at an energy of 10.0 or 10.6 electron volts (interchangeable lamps are available) which are directed into the gas stream. A percentage of the organic molecules in the gas stream having sufficiently low ionization potentials will be ionized by this energy source. The ions produced are collected, forming a small current which is amplified and eventually measured by a potentiometric recorder.

Through this combination of separation and ionization it is possible to detect the presence of numerous organic compounds. When organic compounds of known concentrations are similarly analyzed it becomes possible to quantify the presence of organic compounds in unknown samples through comparison of their relative potentiometric responses.

The operation of the GC is largely independent of sampling techniques. To insure optimal operation the method of injection, injection volume, flow rate and temperature are identical for samples and standards. Fresh standards are prepared daily using the headspace vapor techniques from pure liquid standards.

Glass Teflon syringes are used for all standards and samples. Quality control is assured by the injection of blank samples with syringes prior to their use in sampling or with standards.

The collection of samples requires the ability to withdraw representative soil gas from a known depth in the soil column and maintain the integrity of the sample during transport to the GC. This process is accomplished with a soil gas probe in conjunction with a vacuum pump. This probe is constructed of hollow 7/8-inch O.D. stainless steel with a solid, screw-on tip. The lower one-foot section contains 16 1/6-inch holes which permit entry to the soil gas. The upper section has a 1/16-inch hose barb to which 1/16-inch I.D. urethane tubing is attached.

The probe is driven to the appropriate depth and the tubing attached to a battery operated vacuum pump. The sampling design limits air contact before sampling to stainless steel and a short section of urethane tubing. The vacuum pump is operated for one minute to purge the probe casing and insure a representative sample. The sample is collected by inserting a Pressure-Lock syringe into the air vacuum tubing and withdrawing a one ml sample. The sample is secured in the syringe with the locking mechanism and transported to the GC for injection. The section of tubing perforated by the syringe is removed and the line reconnected to the probe for the next sample.

Appendix E

Soil-Gas Results

Appendix E
Roppe Rubber
Results of Soil-Gas Analyses

Date	Location	Depth	Trans 1,2 DCE	Benzene	TCE	Toluene	PCE	Xylene
10/16/86	1A	4.5'	ND	ND	31.0	ND	ND	ND
10/16/86	1B	4.5'	ND	ND	32.0	ND	ND	ND
10/16/86	2A*	4.0'	ND	ND	<1	ND	ND	ND
10/16/86	2B*	4.0'	ND	ND	1.6	ND	ND	ND
10/16/86	3A*	2.5'	ND	ND	10.0	ND	ND	ND
10/16/86	3B*	2.5'	ND	ND	19.0	ND	ND	ND
10/16/86	4A	4.5'	ND	ND	13.0	ND	ND	ND
10/16/86	4B	4.5'	ND	ND	14.0	ND	ND	ND
10/16/86	5A	4.5'	ND	ND	5.4	ND	ND	ND
10/16/86	5B	4.5'	ND	ND	5.5	ND	ND	ND
10/16/86	6A	4.5'	----	----	----	----	----	----
10/16/86	6B	4.5'	ND	ND	1.3	ND	ND	ND
10/16/86	7A	3.5'	----	----	----	----	----	----
10/16/86	7B	3.5'	ND	ND	<1	ND	ND	ND
10/16/86	8A	3.0'	ND	ND	<1	ND	ND	ND
10/16/86	8B	3.0'	ND	ND	1.4	ND	ND	ND
10/16/86	9A	4.0'	ND	ND	<1	ND	ND	ND
10/16/86	9B	4.0'	ND	ND	1.1	ND	ND	ND
10/16/86	10A	4.0'	ND	ND	6.8	ND	ND	ND
10/16/86	10B	4.0'	ND	ND	6.2	ND	ND	ND
10/16/86	11A	4.0'	ND	ND	1.0	ND	ND	ND
10/16/86	11B	4.0'	ND	ND	1.2	ND	ND	ND

ND = Not Detected
*unidentified peaks present

Date	Location	Depth	Trans 1,2 DCE	Benzene	TCE	Toluene	PCE	Xylene
10/16/86	12A	4.0'	ND	ND	1.2	ND	ND	ND
10/16/86	12B	4.0'	ND	ND	1.4	ND	ND	ND
10/16/86	13A	4.0'	ND	ND	3.5	ND	ND	ND
10/16/86	13B	4.0'	ND	ND	6.3	ND	ND	ND
10/16/86	14A	4.0'	ND	ND	<1	ND	ND	ND
10/16/86	14B	4.0'	ND	ND	1.6	ND	ND	ND
10/16/86	15A	4.0'	ND	ND	<1	ND	ND	ND
10/16/86	15B	4.0'	ND	ND	1.1	ND	ND	ND
10/16/86	16A	4.0'	ND	ND	ND	ND	ND	ND
10/16/86	16B	4.0'	ND	ND	<1	ND	ND	ND
10/16/86	17A	4.0'	ND	ND	1.3	ND	ND	ND
10/16/86	17B	4.0'	ND	ND	2.0	ND	ND	ND
10/17/86	1A	4.0'	ND	ND	28.0	ND	ND	ND
10/17/86	1B	4.0'	ND	ND	24.0	ND	ND	ND
10/17/86	18A	4.0'	ND	ND	24.0	ND	ND	ND
10/17/86	18A	4.0'	ND	ND	3.6	ND	ND	ND
10/17/86	19A	4.0'	ND	ND	ND	ND	ND	ND
10/17/86	19B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	20A	3.0'	ND	<1	<1	ND	ND	ND
10/17/86	20B	3.0'	ND	<1	2.2	ND	ND	ND
10/17/86	21A	3.0'	ND	<1	<1	ND	ND	ND
10/17/86	21B	3.0'	ND	<1	2.0	ND	ND	ND

ND = Not Detected
*unidentified peaks present

Date	Location	Depth	Trans 1,2 DCE	Benzene	TCE	Toluene	PCE	Xylene
10/17/86	22A	2.5'	ND	<1	<1	ND	ND	ND
10/17/86	22B	2.5'	ND	<1	<1	ND	ND	ND
10/17/86	23A	2.5'	ND	<1	<1	ND	ND	ND
10/17/86	23B	2.5'	ND	<1	<1	ND	ND	ND
10/17/86	24A	2.5'	ND	ND	ND	ND	ND	ND
10/17/86	24B	2.5'	ND	ND	<1	ND	ND	ND
10/17/86	24A	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	24B	4.0'	ND	ND	2.4	ND	ND	ND
10/17/86	25A	2.5'	48.0	10.0	26	12.0	30	ND
10/17/86	25B	2.5'	72.0	15.0	34.0	16.0	ND	4.8
10/17/86	25A	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	25B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	26A	2.5'	5.5	<1	3.6	ND	ND	ND
10/17/86	26B	2.5'	11.2	ND	<1	ND	ND	ND
10/17/86	27A	2.5'	ND	<1	3.2	ND	6.0	ND
10/17/86	27B	2.5'	3.2	<1	2.2	ND	5.0	ND
10/17/86	28A	3.0'	ND	ND	<1	ND	ND	ND
10/17/86	28B	3.0'	ND	ND	<1	ND	ND	ND
10/17/86	29A	3.5'	ND	ND	<1	ND	ND	ND
10/17/86	29B	3.5'	ND	ND	<1	ND	ND	ND
10/17/86	30A	3.5'	ND	ND	<1	ND	ND	ND
10/17/86	30B	3.5'	ND	ND	<1	ND	ND	ND
10/17/86	31A	4.0'	ND	ND	<1	ND	ND	ND

ND = Not Detected
*unidentified peaks present

Date	Location	Depth	Trans 1,2 DCE	Benzene	TCE	Toluene	PCE	Xylene
10/17/86	31B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	32A	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	32B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	34A	3.5'	ND	ND	<1	ND	ND	ND
10/17/86	34B	3.5'	ND	ND	<1	ND	ND	ND
10/17/86	35A*	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	35B*	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	36A	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	36B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	37A	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	37B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	38A	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	38B	4.0'	ND	ND	<1	ND	ND	ND
10/17/86	39A	3.5'	ND	ND	2.2	ND	ND	ND
10/17/86	39B	3.5'	ND	ND	3.2	ND	ND	ND
10/17/86	40A	3.0'	ND	ND	2.2	ND	ND	ND
10/17/86	40B	3.0'	ND	ND	<1	ND	ND	ND

ND = Not Detected
*unidentified peaks present

Appendix F

Soil Sample Analytical Results

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW5 Surface #1

Client Keck Consulting Services - Roppe Rubber

Sample Date January 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

Ann Arbor
Technical Services, Inc.
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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW5 Surface #2

Sample Date January 15, 1987

Client Keck Consulting Services - Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

Ann Arbor
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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW5 #3

Sample Date January 15, 1987

Client Keck Consulting Services - Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW5 #4

Sample Date January 15, 1987

Client Keck Consulting Services - Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

Ann Arbor
Technical Services, Inc.
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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW5 #5

Sample Date January 15, 1987

Client Keck Consulting Services - Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001.
Trichloroethene	mg/kg	0.002	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 SS6

Client Keck Consulting Services - Roppe Rubber

Sample Date January 16, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

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Technical Services, Inc.
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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 13' - 16'

Client Keck Consulting Services - Roppe Rubber

Sample Date January 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

Ann Arbor
Technical Services, Inc.
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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 0' - 15' Comp.

Client Keck Consulting Services - Roppe Rubber

Sample Date January 16, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/kg	<0.001	0.001
Bromoform	mg/kg	<0.001	0.001
Carbon tetrachloride	mg/kg	<0.001	0.001
Chlorobenzene	mg/kg	<0.001	0.001
Chloroform	mg/kg	<0.001	0.001
Dibromochloromethane	mg/kg	<0.001	0.001
1,1—Dichloroethane	mg/kg	<0.001	0.001
1,2—Dichloroethane	mg/kg	<0.001	0.001
1,1—Dichlorothene	mg/kg	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/kg	<0.001	0.001
1,2—Dichloropropane	mg/kg	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/kg	<0.001	0.001
Methylene chloride	mg/kg	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/kg	<0.001	0.001
Tetrachloroethene	mg/kg	<0.001	0.001
1,1,1—Trichloroethane	mg/kg	<0.001	0.001
1,1,2—Trichloroethane	mg/kg	<0.001	0.001
Trichloroethene	mg/kg	<0.001	0.001
MDNR Organic Scan II			
Benzene	mg/kg	<0.001	0.001
Toluene	mg/kg	<0.001	0.001
Ethylbenzene	mg/kg	<0.001	0.001
Styrene	mg/kg	<0.001	0.001
Total Xylenes	mg/kg	<0.001	0.001

NOTE: The above concentrations are expressed on a dry weight basis.

Appendix G

Geologist's Logs

BORING/WELL LOG DATA
KECK CONSULTING SERVICES, INC.

PROJECT: #0036-1655 Roppe Rubber	WELL/BORING No.: MW-4
LOCATION: Fostoria, OH	DATE DRILLED: January 15&16, 1987
DRILLING METHOD: Air Rotary	CASING TYPE/DIA.: surface casing 6 3/8-inch stainless steel
TOTAL DEPTH DRILLED: 197 feet BGL	TOTAL CASING: 15 feet
GROUND ELEVATION: 762.62 feet	T.O.C. ELEVATION: 765.54 feet
GROUT TYPE/QUANTITY: neat cement/bentonite	SCREEN TYPE/LENGTH: uncased below 12 feet
GROUT INTERVAL(S): ground level - 12 feet BGL	SCREENED INTERVAL:
DEPTH TO WATER: approx. 17.5 feet BGL	GRAVEL PACK TYPE:
WATER LEVEL ELEVATION:	GRAVEL PACK INTERVAL:
	STATIC WATER LEVEL: DATE:
REMARKS: Drilled by Sever Well Drilling, Delphos, Ohio	
LOGGED BY: Stephen Manz	SIGNATURE:

DEPTH	H2O/SOIL SAMPLE	FORMATION DESCRIPTION
0-0.25		ASPHALT
0.25-1		CLAY; black, moist, cohesive
1-2.5		CLAY; brown, cohesive, moist
2.5-24		DOLOMITE; gray, porous, sparite, penetration = 2 ft/min, sat. at 17'
24-55		AS ABOVE; beige colored water
55-64		DOLOMITE; very loose, drill rod dropped from 55-57 feet with
		resistance, grayish dolomite, reddish chert nodules from 55 feet
64-79		DOLOMITE; sparry, gray, becoming tan at 70 feet, penetration = 1.5
		ft/min
79-94		DOLOMITE; sparry, tan-lt. gray at 78 feet
94-110		DOLOMITE; gray, sparry, brown clay seam at 94 feet, penetration =
		1.5 ft/min
110-125		DOLOMITE; sparry, gray, penetration = 1 ft/min
125-140		DOLOMITE; sparry, lt. gray-lt. brown, porous, penetration = 0.8 ft/min
140-155		DOLOMITE; sparry, lt. brown from 140-145 feet, turning white-tan at
		145 feet, penetration = 0.9 ft/min
155-170		DOLOMITE; sparry, white-tan
170-198		DOLOMITE; sparry, gray-white, easier drilling at 170 feet, pene-
		tration = 1 ft/min

BORING/WELL LOG DATA
KECK CONSULTING SERVICES, INC.

PROJECT: #0036-1655 Roppe Rubber	WELL/BORING No.: MW-5
LOCATION: Fostoria, OH	DATE DRILLED: January 15, 1987
DRILLING METHOD: Air Rotary	CASING TYPE/DIA.: surface casing 6 3/8-inch stainless steel
TOTAL DEPTH DRILLED: 200 feet BGL	TOTAL CASING: 15 feet
GROUND ELEVATION: 764.43 feet	T.O.C. ELEVATION: 765.95 feet
GROUT TYPE/QUANTITY: neat cement/bentonite	SCREEN TYPE/LENGTH: uncased below 13.5 feet
GROUT INTERVAL(S): 0 - 14 feet BGL	SCREENED INTERVAL:
DEPTH TO WATER: approx. 16.1 feet BGL	GRAVEL PACK TYPE:
WATER LEVEL ELEVATION:	GRAVEL PACK INTERVAL:
	STATIC WATER LEVEL: DATE:

REMARKS: Drilled by Sever Well Drilling, Delphos, Ohio

LOGGED BY: Stephen Manz | SIGNATURE:

DEPTH	H2O/SOIL SAMPLE	FORMATION DESCRIPTION
0-2.5		CLAY; brown, cohesive, moist
2.5-24		DOLOMITE; sparry, buff-gray, porous, sturated at 16'
24-55		DOLOMITE; high water production, voids, 1-inch drops at 51 feet,
		chert nodules from 50 feet
55-64		DOLOMITE; as above, very loose from 58-61 ft., penetration = 2 ft/min
64-140		DOLOMITE; becoming denser, penetration = 1 ft/min, gray-tan, sparry,
		soft from 134-135 feet
140-155		DOLOMITE; sparry, lt. brown, iron colored water
155-170		DOLOMITE; sparry, becoming white at 160 feet, penetration = 0.8 ft/min
170-185		DOLOMITE; sparry, gray-white, penetration = 1.5 ft/min
185-200		DOLOMITE; sparry, gray-white to 190 feet, tan from 190-200 feet

BORING/WELL LOG DATA

KECK CONSULTING SERVICES, INC.

PROJECT: #0036-1655 Roppe Rubber	WELL/BORING No.: MW-6
LOCATION: Fostoria, OH	DATE DRILLED: January 16, 1987
DRILLING METHOD: Air Rotary	CASING TYPE/DIA.: surface casing 6 3/8-inch stainless steel
TOTAL DEPTH DRILLED: 198.4 feet BGL	TOTAL CASING: 15 feet
GROUND ELEVATION: 766.04 feet	T.O.C. ELEVATION: 767.69 feet
GROUT TYPE/QUANTITY: neat cement/bentonite	SCREEN TYPE/LENGTH: uncased below 13.35 feet
GROUT INTERVAL(S): 0 - 13.35 feet BGL	SCREENED INTERVAL:
DEPTH TO WATER: approx. 21 feet	GRAVEL PACK TYPE:
WATER LEVEL ELEVATION:	GRAVEL PACK INTERVAL:
	STATIC WATER LEVEL: DATE:
REMARKS: Drilled by Sever Well Drilling, Delphos, Ohio	
LOGGED BY: Stephen Manz	SIGNATURE:

DEPTH	H2O/SOIL SAMPLE	FORMATION DESCRIPTION
0-8		CLAY; brown, cohesive, intermixed w/gravel fill
8-23		DOLOMITE; sparry, tan, saturated at 21'
23-43		AS ABOVE; very little water production, tan-gray, penetration = 1.3
		ft/min
43-63		DOLOMITE; tan at 45 feet, very loow from 62-63 feet, penetration =
		2 ft/min
63-78		DOLOMITE; sparry, tan-brown, penetration = 1.36 ft/min
78-93		AS ABOVE; penetration = 1.9 ft/min
93-108		AS ABOVE; w/yellow calcite crystal, penetration = 1.9 ft/min
108-123		DOLOMITE; sparry, gray, penetration = 0.9 ft/min
123-138		DOLOMITE; sparry, gradually tanning, penetration = 1.2 ft/min
138-153		DOLOMITE; gray-tan, sparry, penetration = 1.1 ft/min
153-169		AS ABOVE; penetration = 1.5 ft/min
169-184		DOLOMITE; tan, sparry, penetration = 1.5 ft/min
184-199		DOLOMITE; white-gray, sparry, penetration = 1.25 ft/min

Appendix H

Water Quality Analytical Results
March, 1987

Ground-Water Quality Results

Ann Arbor Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #3 MW4 187' - 192'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 14, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.003	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #4 MW4 169' - 174'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.002	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #7 MW4 151' - 156'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 16, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #9 MW4 133' - 138'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 17, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #10 MW4 115' - 120'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 17, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.003	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #11 MW4 79' - 84'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 18, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.007	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.012	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.080	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #12 MW4 43' - 48'

Client Keck Consulting Services, Inc.

Roppe Rubber

Sample Date March 18, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.006	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.011	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.075	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #13 MW4 25' - 30'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 18, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.036	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.16	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #14 MW5 187' - 192'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 18, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.38	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.002	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.6	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #15 MW5 169' - 174'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 19, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.23	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.002	0.001
1,1,1—Trichloroethane	mg/l	0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.8	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #16 MW5 151' - 156'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 19, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.24	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.002	0.001
1,1,1—Trichloroethane	mg/l	0.004	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.8	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #17 MW-5 133' - 138'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 19, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.22	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.001	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.8	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #18 MW5 115' - 120'

Client Keck Consulting Services, inc.
Roppe Rubber

Sample Date March 19, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.21	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.001	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.8	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #20 MW5 97' - 102'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 19, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.22	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.6	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #21 MW5 79' - 84'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 20, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.22	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.001	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.7	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #22 MW5 61' - 66'

Sample Date March 20, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.22	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.002	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.4	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #23 MW5 43' - 48'

Sample Date March 20, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.22	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.001	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.8	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #24 MW5 25' - 30'

Sample Date March 20, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.21	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	0.002	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.9	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 22' - 27'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 23, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.098	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.92	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 40' - 45'

Sample Date March 23, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.11	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.0	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 58' - 63'

Client Keck Consulting Services, Inc.

Roppe Rubber

Sample Date March 22, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.099	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.87	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 76' - 81'

Sample Date March 22, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.12	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.002	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.98	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 94' - 99'

Sample Date March 22, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.13	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.002	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.2	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 112' - 117'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 22, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.16	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	0.004	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.8	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 130' - 135'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 22, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.12	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	0.004	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.2	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 148' - 153'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 22, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.051	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.50	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 166' - 171'

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 22, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg 1	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.062	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	0.72	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0 001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Ann Arbor Technical Services, Inc.
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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 184' - 189'

Sample Date March 21, 1987

Client Keck Consulting Services, Inc.
Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	0.11	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	1.3	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Drilling Water

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample Supply Water

Client Keck Consulting Services - Roppe Rubber

Sample Date January 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.004	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.040	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001

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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW4 Drilling Water

Client Keck Consulting Services - Roppe Rubber

Sample Date January 17, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.002	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.022	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001

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Date February 4, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW5 Drilling Water

Client Keck Consulting Services - Roppe Rubber

Sample Date January 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.001	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	<0.001	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001

Sampling Program

Ann Arbor
Technical Services, Inc.
6540 Jackson Road • Ann Arbor, Michigan 48103 • 313-995-0995

Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #1 Steam Cleaner Discharge

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 12, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.006	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.038	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #2 Water Supply from Garden Hose

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 12, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.009	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.052	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #5 Soapy Water from Decon Bucket

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	<0.1	0.1
Bromoform	mg/l	<0.1	0.1
Carbon tetrachloride	mg/l	<0.1	0.1
Chlorobenzene	mg/l	<0.1	0.1
Chloroform	mg/l	<0.1	0.1
Dibromochloromethane	mg/l	<0.1	0.1
1,1—Dichloroethane	mg/l	<0.1	0.1
1,2—Dichloroethane	mg/l	<0.1	0.1
1,1—Dichlorothene	mg/l	<0.1	0.1
1,2—Dichloroethene (cis & trans)	mg/l	<0.1	0.1
1,2—Dichloropropane	mg/l	<0.1	0.1
1,3—Dichloropropene (cis & trans)	mg/l	<0.1	0.1
Methylene chloride	mg/l	<0.1	0.1
1,1,2,2—Tetrachloroethane	mg/l	<0.1	0.1
Tetrachloroethene	mg/l	<0.1	0.1
1,1,1—Trichloroethane	mg/l	<0.1	0.1
1,1,2—Trichloroethane	mg/l	<0.1	0.1
Trichloroethene	mg/l	<0.1	0.1
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.1	0.1
Toluene	mg/l	<0.1	0.1
Ethylbenzene	mg/l	<0.1	0.1
Total Xylenes	mg/l	<0.1	0.1
Styrene	mg/l	<0.1	0.1

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #6 Rinse Water from Decon Bucket

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 15, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.009	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.053	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #8 Rinse Water from Keck Pump

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 16, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.008	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.048	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample #19 Rinse Water Decon Bucket through Bailer

Sample Date March 19, 1987

Client Keck Consulting Services, Inc. Roppe Rubber

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.003	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.028	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCANN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

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Date April 6, 1987

MDNR ORGANIC SCAN I
PURGEABLE HALOCARBONS

Sample MW6 Bailer Blank

Client Keck Consulting Services, Inc.
Roppe Rubber

Sample Date March 23, 1987

Project Number 29353

Parameter	Units	Conc.	Detection Limit
Bromodichloromethane	mg/l	0.004	0.001
Bromoform	mg/l	<0.001	0.001
Carbon tetrachloride	mg/l	<0.001	0.001
Chlorobenzene	mg/l	<0.001	0.001
Chloroform	mg/l	0.032	0.001
Dibromochloromethane	mg/l	<0.001	0.001
1,1—Dichloroethane	mg/l	<0.001	0.001
1,2—Dichloroethane	mg/l	<0.001	0.001
1,1—Dichlorothene	mg/l	<0.001	0.001
1,2—Dichloroethene (cis & trans)	mg/l	<0.001	0.001
1,2—Dichloropropane	mg/l	<0.001	0.001
1,3—Dichloropropene (cis & trans)	mg/l	<0.001	0.001
Methylene chloride	mg/l	<0.001	0.001
1,1,2,2—Tetrachloroethane	mg/l	<0.001	0.001
Tetrachloroethene	mg/l	<0.001	0.001
1,1,1—Trichloroethane	mg/l	<0.001	0.001
1,1,2—Trichloroethane	mg/l	<0.001	0.001
Trichloroethene	mg/l	<0.001	0.001
MDNR ORGANIC SCAN II			
Benzene	mg/l	<0.001	0.001
Toluene	mg/l	<0.001	0.001
Ethylbenzene	mg/l	<0.001	0.001
Total Xylenes	mg/l	<0.001	0.001
Styrene	mg/l	<0.001	0.001

Appendix I

In-Situ Hydraulic Test Results

Roppe Rubber

Results of "In-Situ" Permeability Analysis

Well No.	Tested Interval*	Elevation (amsl)	Permeability K (ft/day)
MW-4	187 - 192	578.5 - 573.5	2.9
MW-4	169 - 174	596.5 - 591.5	0.9
MW-4	151 - 156	614.5 - 609.5	0.3
MW-4	133 - 138	632.5 - 627.5	8.3
MW-4	115 - 120	650.5 - 645.5	13.1
MW-4	79 - 84	686.5 - 681.5	52.8
MW-4	43 - 48	722.5 - 717.5	9.3
MW-4	25 - 30	740.5 - 735.5	39.6
MW-5	187 - 192	579 - 574	3.8
MW-5	169 - 174	597 - 592	2.3
MW-5	151 - 156	615 - 610	16.4
MW-5	133 - 138	633 - 628	6.7
MW-5	115 - 120	651 - 646	11
MW-5	97 - 102	669 - 664	10.3
MW-5	79 - 84	687 - 682	16.4
MW-5	61 - 66	705 - 700	2.8
MW-5	43 - 48	723 - 718	26.9
MW-5	25 - 30	741 - 736	5.6
MW-6	184 - 189	583.7 - 578.7	2.4
MW-6	166 - 171	601.7 - 596.7	5.4
MW-6	148 - 153	619.7 - 614.7	4.1
MW-6	130 - 135	637.7 - 632.7	7.1
MW-6	112 - 117	655.7 - 650.7	20.9
MW-6	94 - 99	673.7 - 668.7	6.1
MW-6	76 - 81	691.7 - 686.7	6.2
MW-6	58 - 63	709.7 - 704.7	2.7
MW-6	40 - 45	727.7 - 722.7	19.4

*relative to top of surface casing

Appendix J

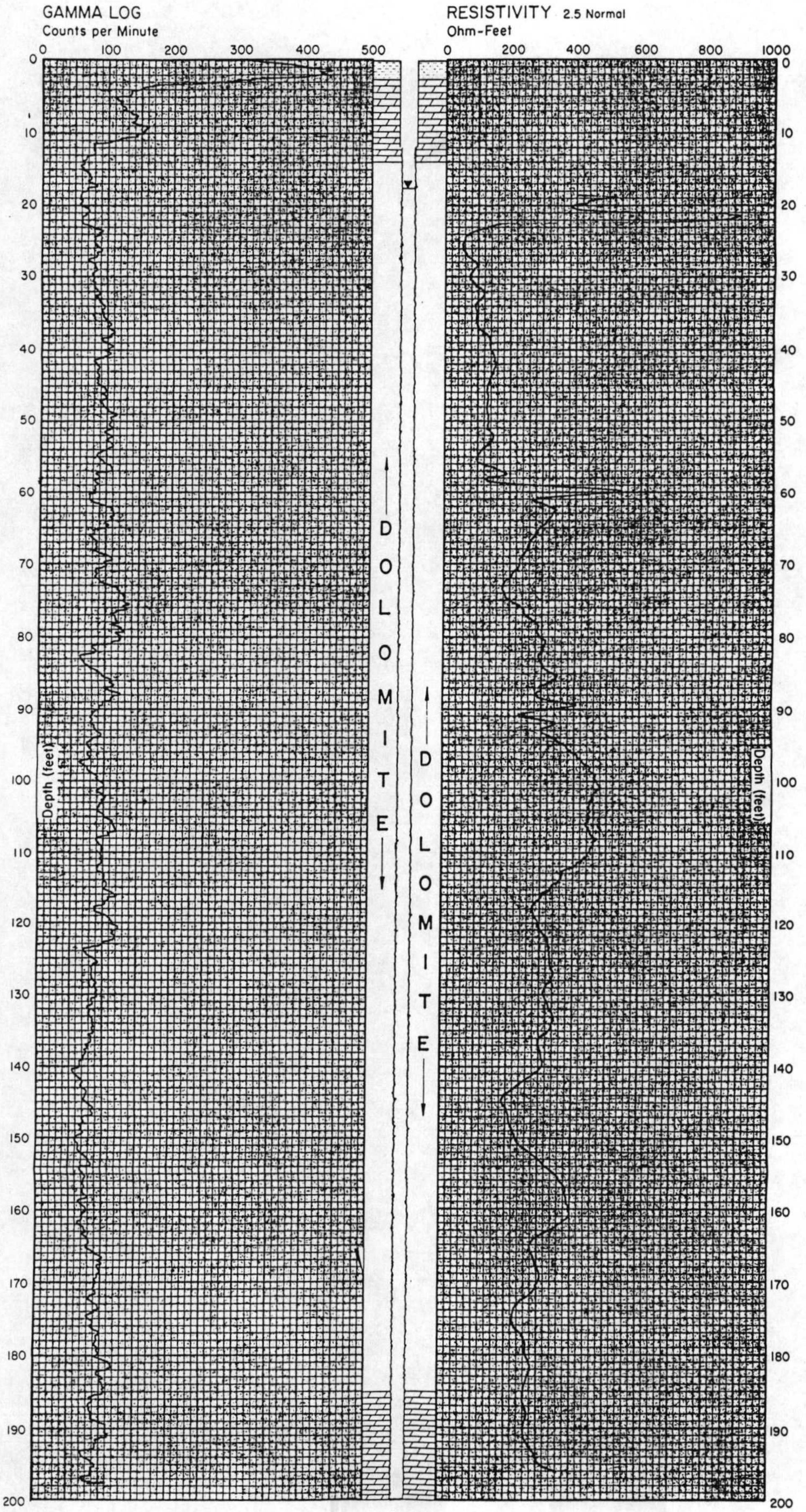
Geophysical Logs - Monitor Wells
January, 1987

MW-4

Roppe Rubber Corporation

1602 N. Union Street

Seneca County, Fostoria, Ohio

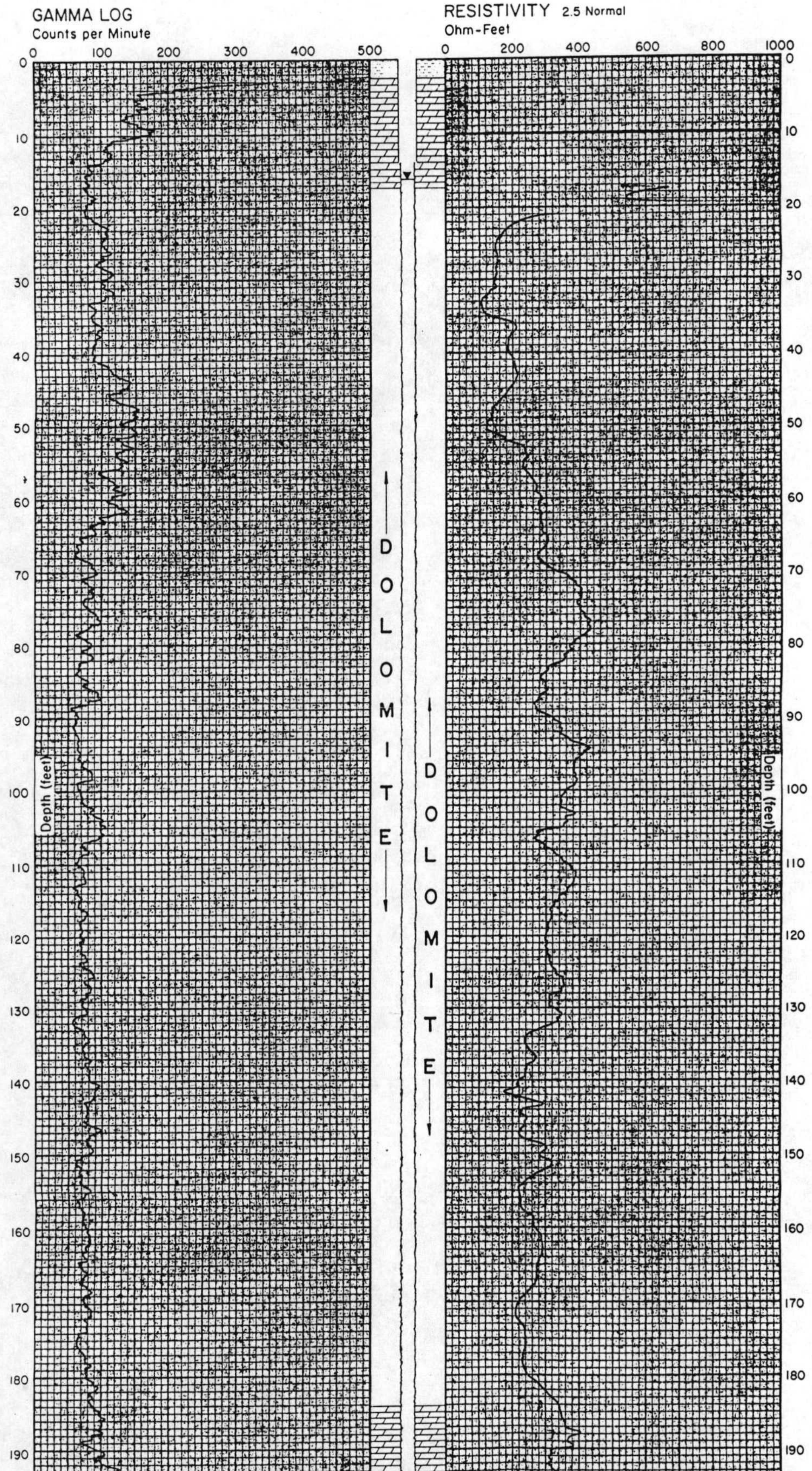


4/15/87

KECK consulting services, inc

MW-5

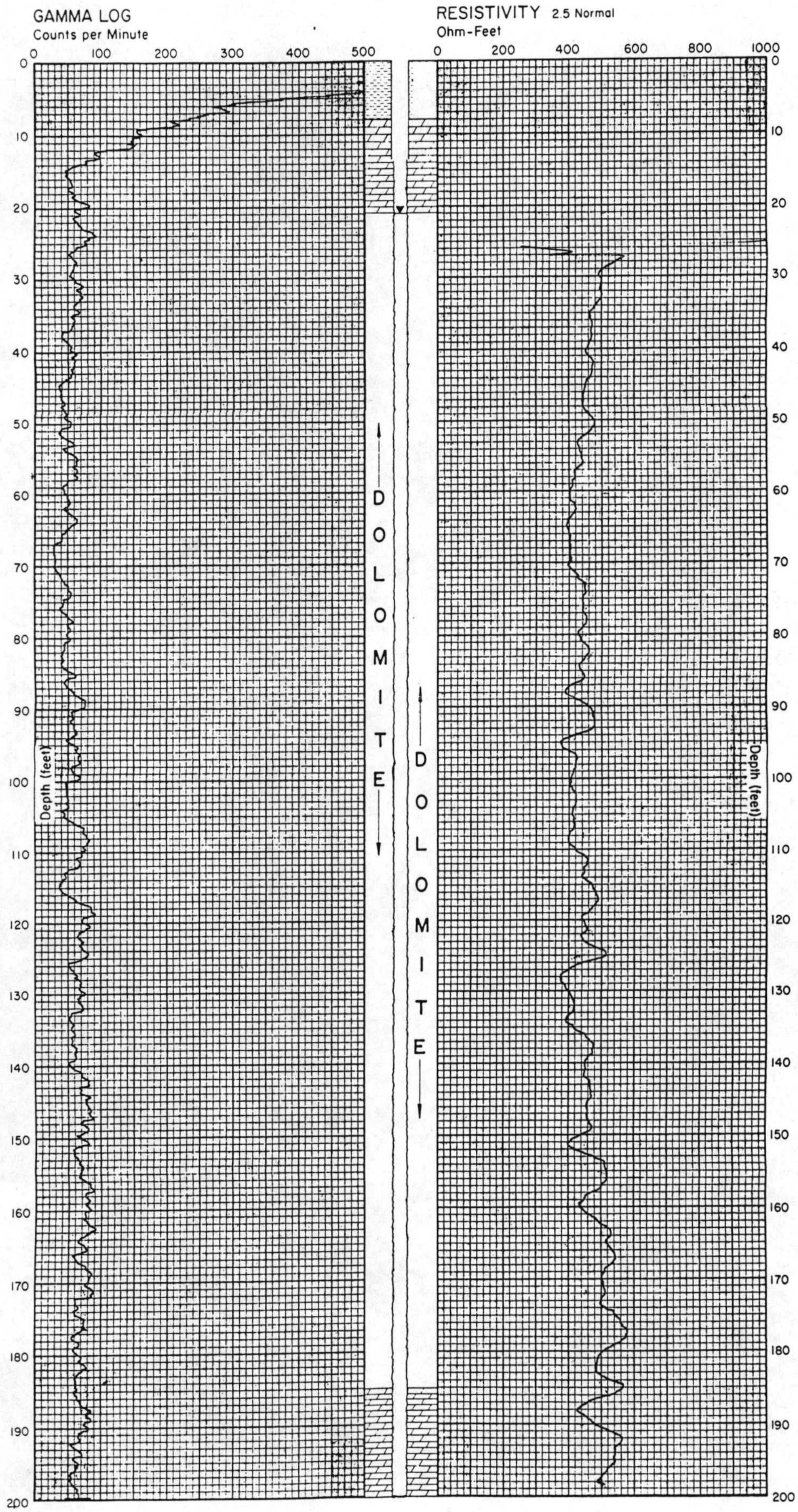
Roppe Rubber Corporation
1602 N. Union Street
Seneca County, Fostoria, Ohio



MW-6

Roppe Rubber Corporation

1602 N. Union Street
Seneca County, Fostoria, Ohio



Appendix K

Ground-Water Elevation Data Table
March, 1987

DATE Fri. 3/13/87 11a.m.-12noon PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.75'	743.79'
MW5	764.43'	1.52'	765.95'	18.50'	747.45'
MW6	766.04'	1.65'	767.69'	25.16'	742.53'
WELL #1			762.41'	21.28'	741.13'
WELL #2			761.72'	34.19'	727.53'
WELL #3	762.70'	0.79'	763.49'	22.24'	741.25'

KECK consulting services, inc.

DATE Sun. 3/15/87 9a.m.-10a.m. PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.43'	744.11'
MW5	764.43'	1.52'	765.95'	18.25'	747.70'
MW6	766.04'	1.65'	767.69'	21.93'	745.76'
WELL #1			762.41'	16.95'	745.46'
WELL #2			761.72'	20.22'	741.50'

DATE Mon. 3/16/87 9:30a.m.-10:30a.m. **PROJECT** #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.78'	743.76'
MW5	764.43'	1.52'	765.95'	18.15'	747.80'
MW6	766.04'	1.65'	767.69'	23.12'	744.57'
WELL #1			762.41'	20.55'	741.86'
WELL #2			761.72'	*	
WELL #3	762.70'	0.79'	763.49'	23.16'	740.33'

KECK consulting services, inc.

*Electric probe stuck in Well #1, therefore no readings were obtained

DATE Mon. 3/16/87 4:00p.m. **PROJECT** #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	22.00'*	743.54'
MW5	764.43'	1.52'	765.95'	18.15'	747.80'
MW6	766.04'	1.65'	767.69'	23.44'	744.25'

*Reading taken @ 2:00p.m.

KECK consulting services, inc.

DATE Tues. 3/17/87 10:15-10:30a.m. **PROJECT** #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW5	764.43'	1.52'	765.95'	18.30'	747.65'
MW6	766.04'	1.65'	767.69'	23.99'	743.70'

KECK consulting services, inc.

DATE Tue. 3/17/87 4:00-4:15p.m. PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW5	764.43'	1.52'	765.95'	18.35'	747.60'
MW6	766.04	1.65'	767.69'	24.35'	743.34'

KECK consulting services, inc.

DATE Wed. 3/18/87 11:15-11:30a.m. PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW5	764.43'	1.52'	765.95'	18.40'	747.55'
MW6	766.04'	1.65'	767.69'	24.73'	742.96'

KECK consulting services, inc.

DATE Wed. 3/18/87 4:00-4:30p.m. **PROJECT** #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.48'	744.06'
MW5	764.43'	1.52'	765.95'	18.48'	747.47'
MW6	766.04'	1.65'	767.69'	24.75'	742.94'

KECK consulting services, inc.

DATE Thurs. 3/19/87 11:15-11:30a.m. PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.49'	744.05'
MW6	766.04'	1.65'	767.69'	24.87'	742.82'

KECK consulting services, inc.

DATE Thurs. 3/19/87 3:45-4:00p.m.   PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.34'	744.20'
MW6	766.04'	1.65'	767.69'	25.02'	742.67'

KECK consulting services, inc.

DATE Fri. 3/20/87 PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	21.78'	743.76'
MW5	764.43'	1.52'	765.95'	18.50'	747.45'
MW6	766.04'	1.65'	767.69'	25.37'	742.32'
WELL #2			761.72'	33.46'	728.26'
WELL #3	762.70'	0.79'	763.49'	22.00'	741.49'

KECK consulting services, inc.

DATE Sun. 3/22/87 9:30-10:30a.m. PROJECT #0036-1655 Roppe Rubber Company

WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62'	2.92'	765.54'	20.66'	744.88'
MW5	764.43'	1.52'	765.95'	18.31'	747.64'
MW6	766.04'	1.65'	767.69'	22.71'	744.98'
WELL #1			762.41'	16.61'	745.80'
WELL #2			761.72'	20.02'	741.70'
WELL #3	762.70'	0.79'	763.49'	19.35'	744.14'

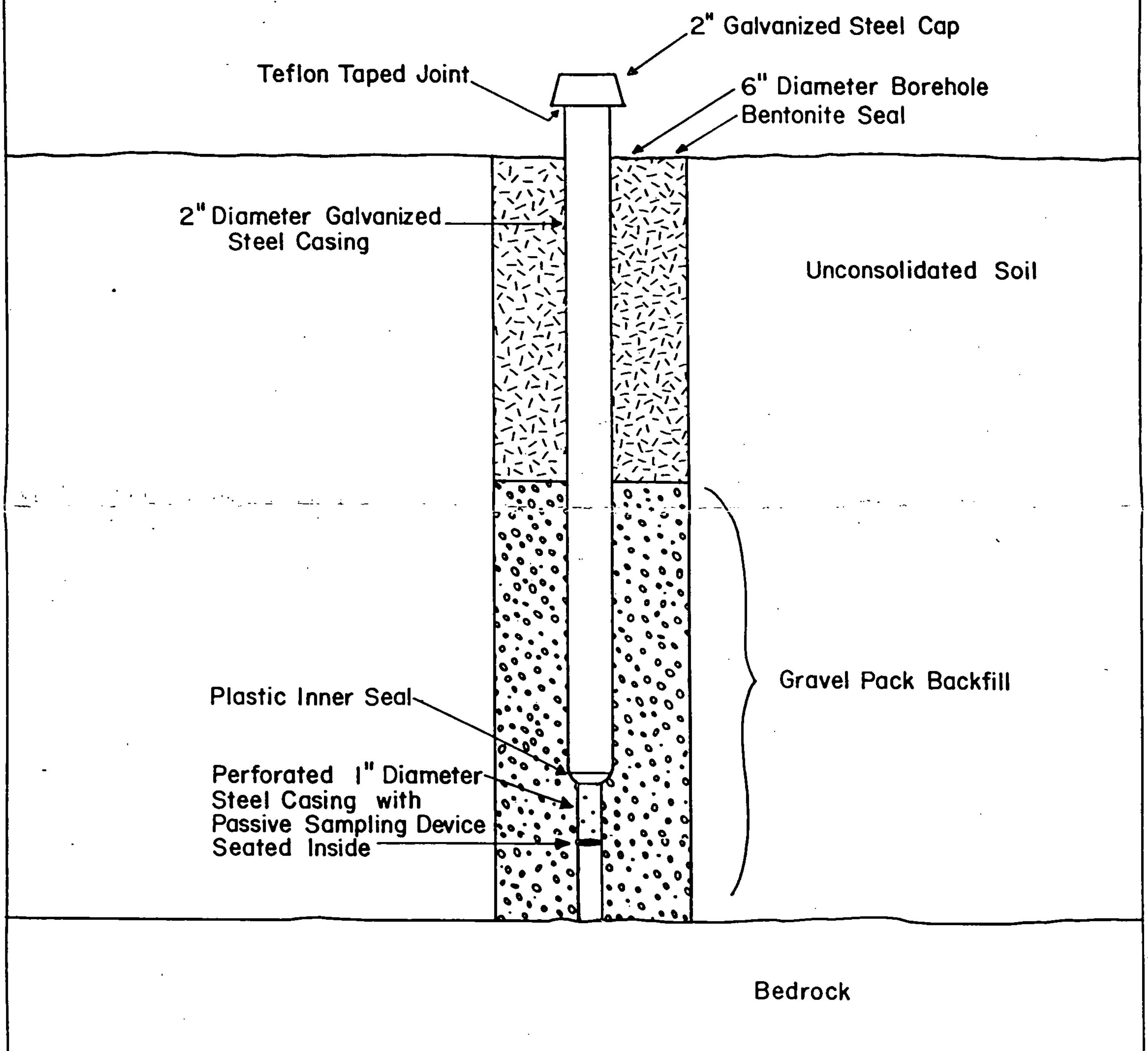
KECK consulting services, inc.

DATE Sun. 3/22/87 9:00-9:30p.m. PROJECT #0036-1655 Roppe Rubber Company

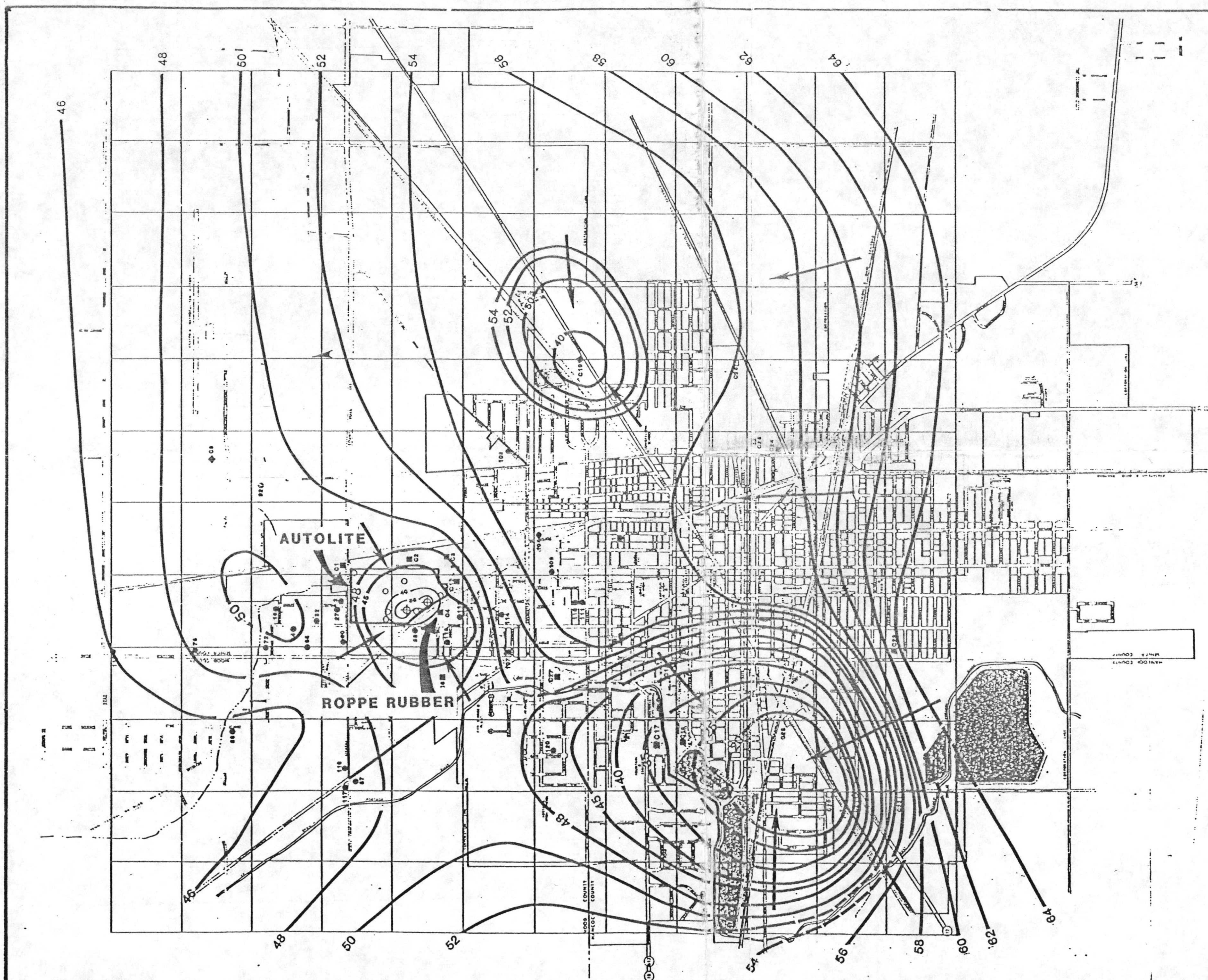
WELL #	GROUND ELEVATION	CASING HEIGHT	CASING ELEVATION	DEPTH TO WATER	WATER-TABLE ELEVATION
MW4	762.62	2.92'	765.54'	20.37'	745.17'
MW5	764.43'	1.52'	765.95'	18.18'	747.77'
WELL #3	762.70'	0.79'	763.49'	18.70'	744.79'

Schematic Diagram of Passive Soil-gas Sampling Device Construction
Roppe Rubber Company

Not to Scale



KECK consulting services, inc



REMEDIAL INVESTIGATION
FOSTORIA, OHIO

EXHIBIT C
GROUNDWATER FLOW
IN THE LOCKPORT DOLOMITE
ON 1/30/85

T A GLEASON ASSOCIATES

B4464

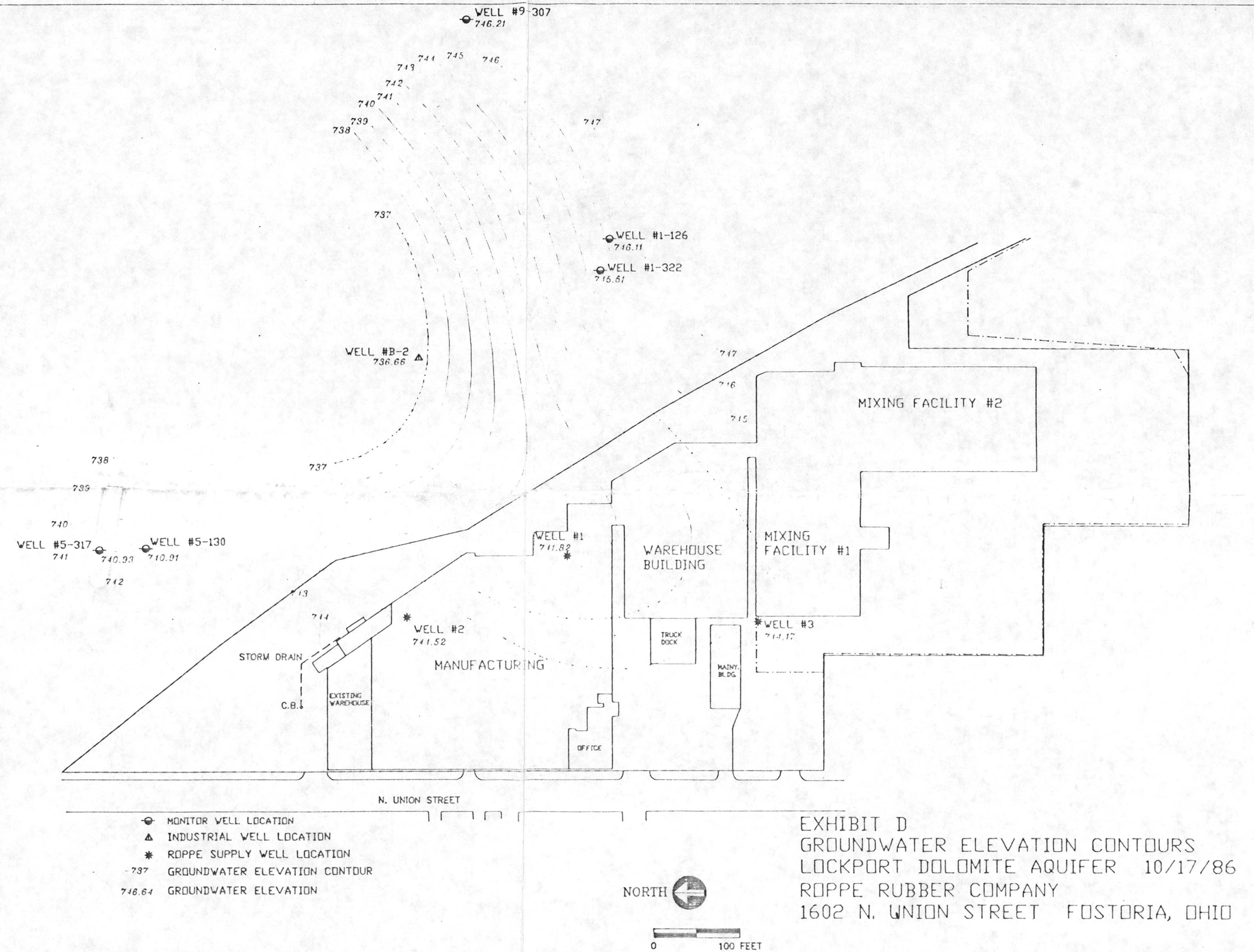
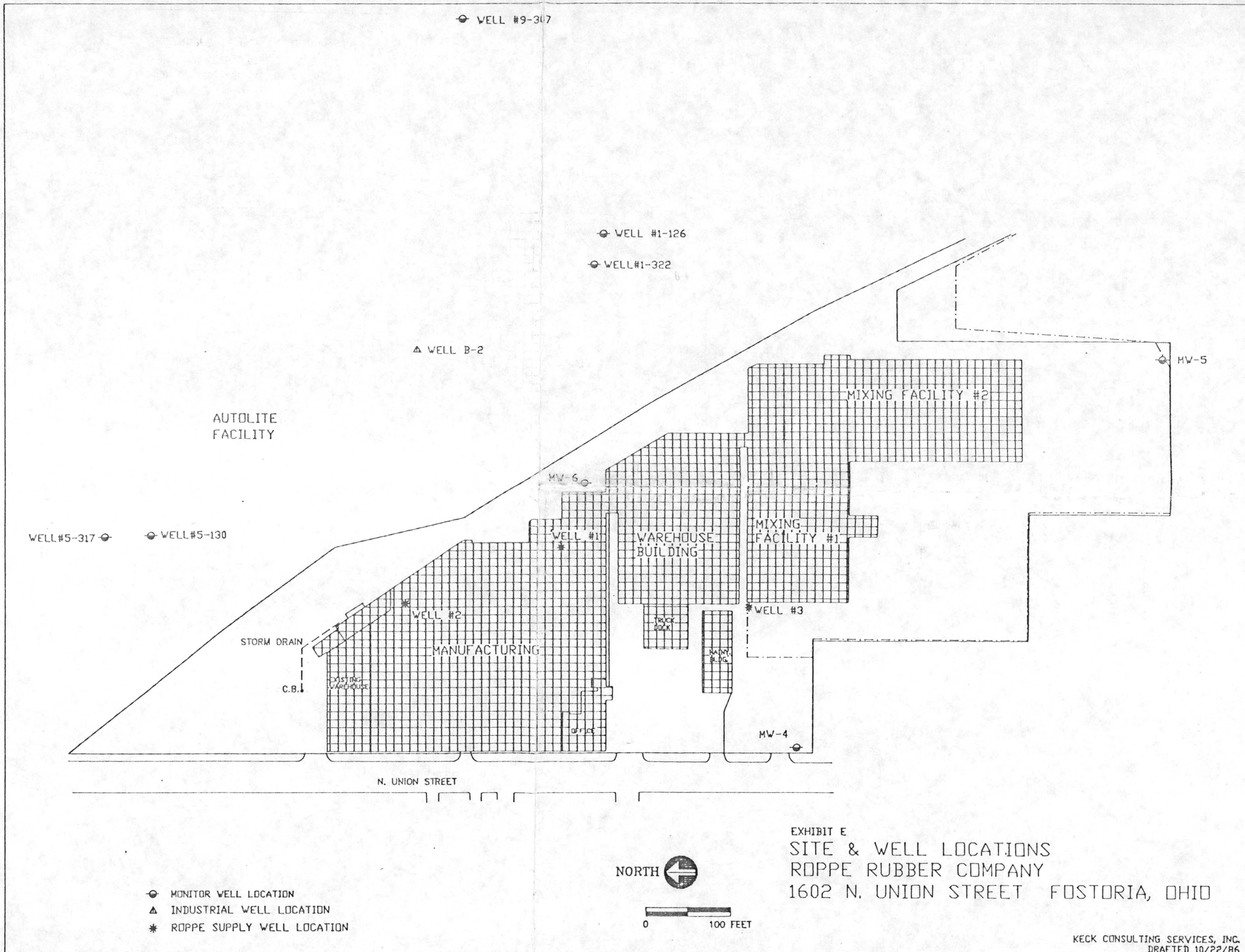


EXHIBIT D
GROUNDWATER ELEVATION CONTOURS
LOCKPORT DOLOMITE AQUIFER 10/17/86
ROPPE RUBBER COMPANY
1602 N. UNION STREET FOSTORIA, OHIO

KECK CONSULTING SERVICES, INC.
DRAFTED 10/22/86



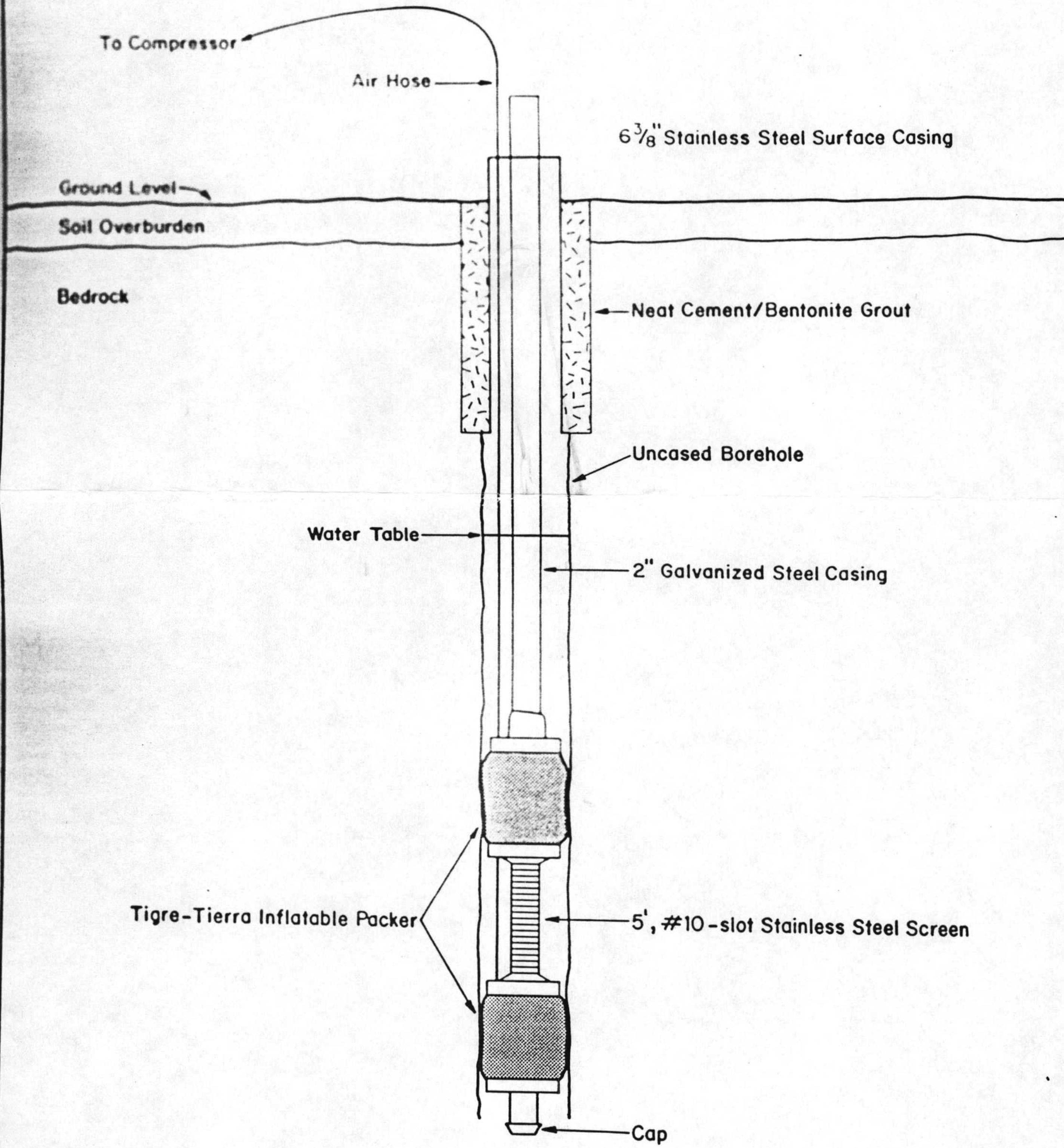
WELL #9-307
WELL #1-126
WELL#1-322
WELL B-2
MW-5
AUTOLITE
FACILITY
MIXING FACILITY #2
MW-6
WELL #1
WAREHOUSE
BUILDING
MIXING
FACILITY #1
WELL#5-317
WELL#5-130
WELL #2
WELL #3
TRUCK DOCK
STORM DRAIN
MANUFACTURING
MAINT. BLDG.
C.B.
EXISTING WAREHOUSE
OFFICE
MW-4
N. UNION STREET
EXHIBIT E
SITE & WELL LOCATIONS
ROPPE RUBBER COMPANY
1602 N. UNION STREET FOSTORIA, OHIO
NORTH
MONITOR WELL LOCATION
INDUSTRIAL WELL LOCATION
ROPPE SUPPLY WELL LOCATION
0
100 FEET
KECK CONSULTING SERVICES, INC.
DRAFTED 10/22/86

EXHIBIT F

DIAGRAM OF GROUNDWATER SAMPLING SYSTEM

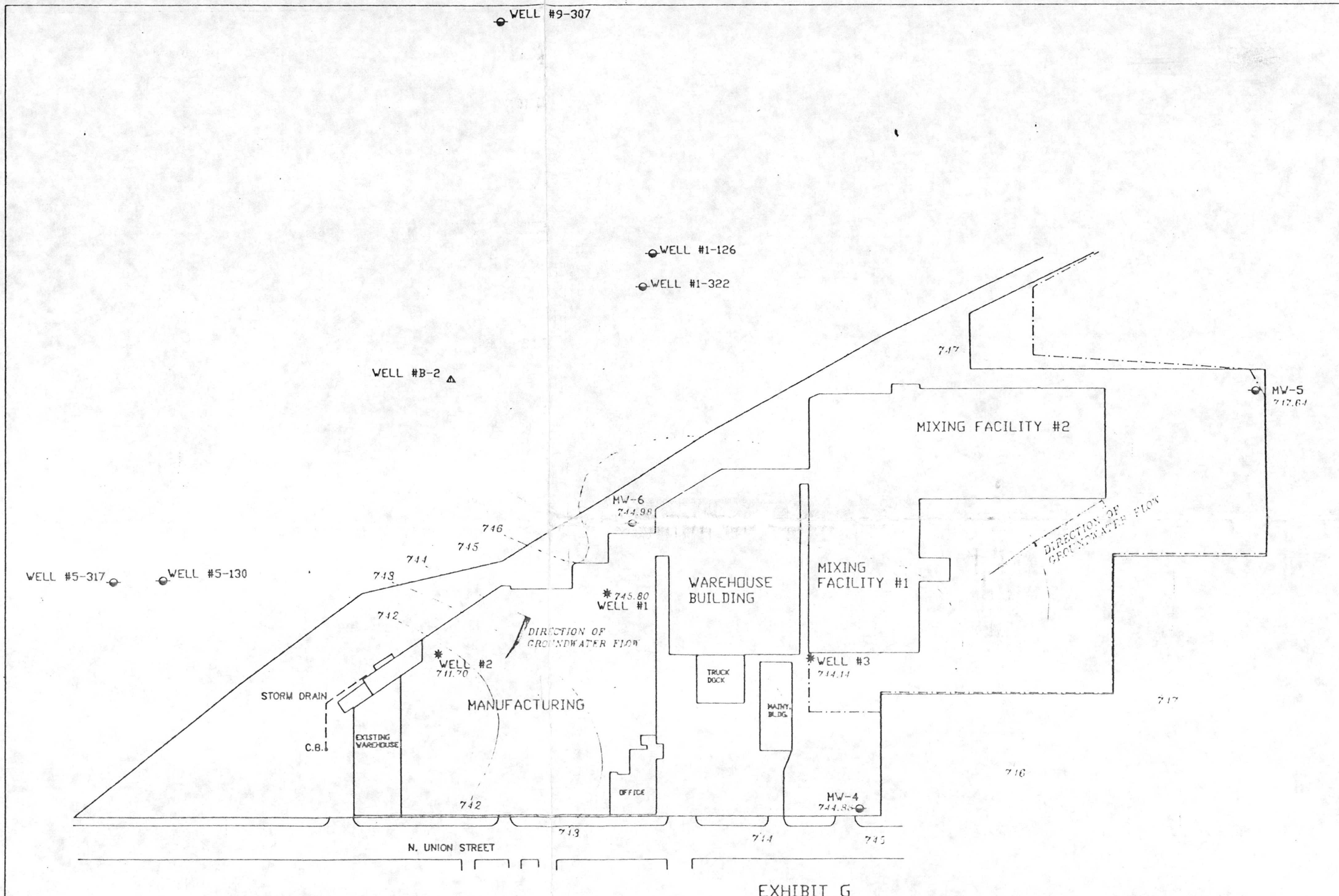
Roppe Rubber Company

NOT TO SCALE



4/10/87

KECK consulting services, inc.



- MONITOR WELL LOCATION
- INDUSTRIAL WELL LOCATION
- ROPPE SUPPLY WELL LOCATION
- 737 GROUNDWATER ELEVATION CONTOUR
- 746.64 GROUNDWATER ELEVATION

EXHIBIT G
GROUNDWATER ELEVATION CONTOURS-NON-PUMPING CONDITIONS
LOCKPORT DOLOMITE AQUIFER 3/22/87
ROPPE RUBBER COMPANY
1602 N. UNION STREET FOSTORIA, OHIO

KECK CONSULTING SERVICES, INC.
DRAFTED 10/22/86

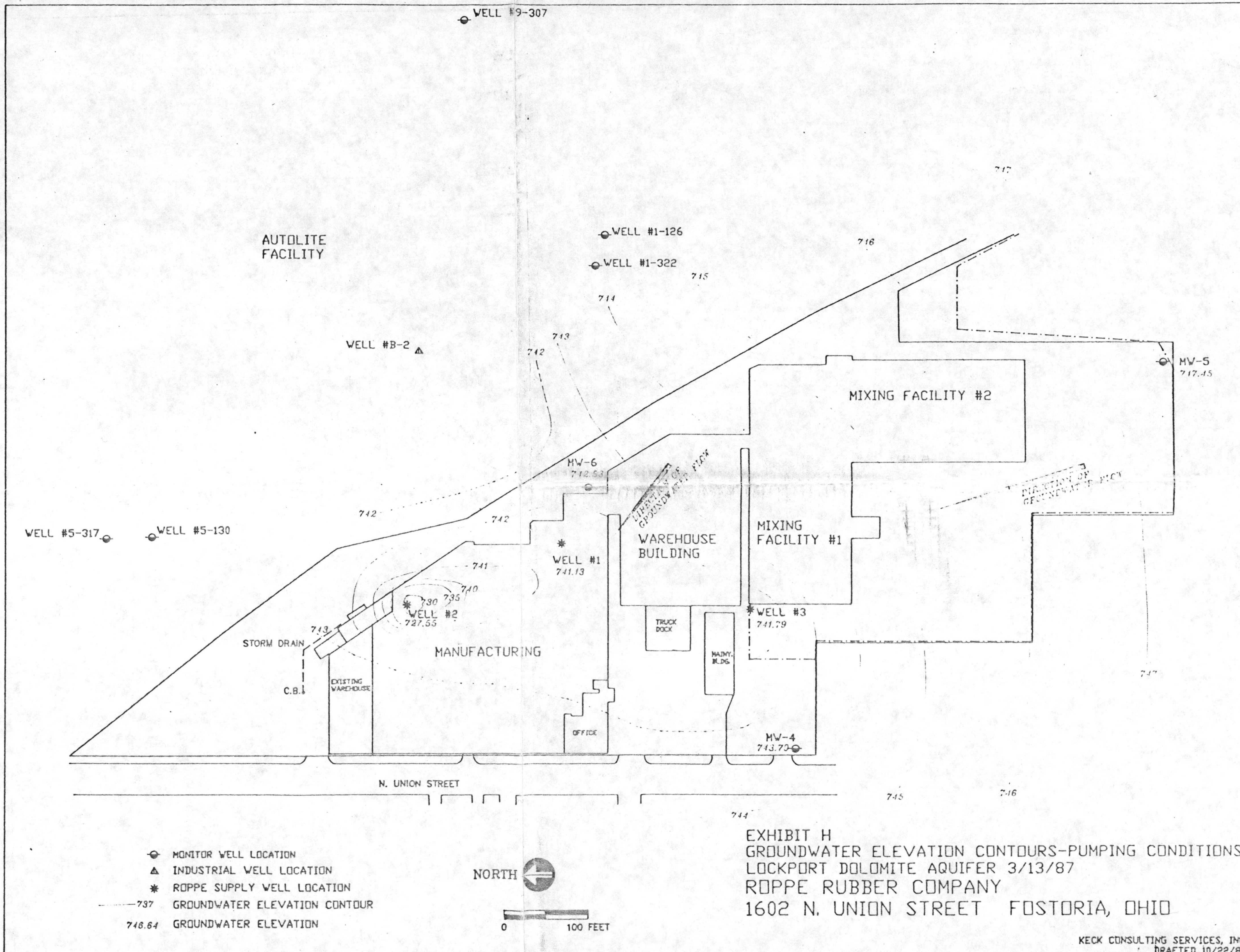


EXHIBIT H
GROUNDWATER ELEVATION CONTOURS-PUMPING CONDITIONS
LOCKPORT DOLOMITE AQUIFER 3/13/87
ROPPE RUBBER COMPANY
1602 N. UNION STREET FOSTORIA, OHIO

KECK CONSULTING SERVICES, INC.
DRAFTED 10/22/86

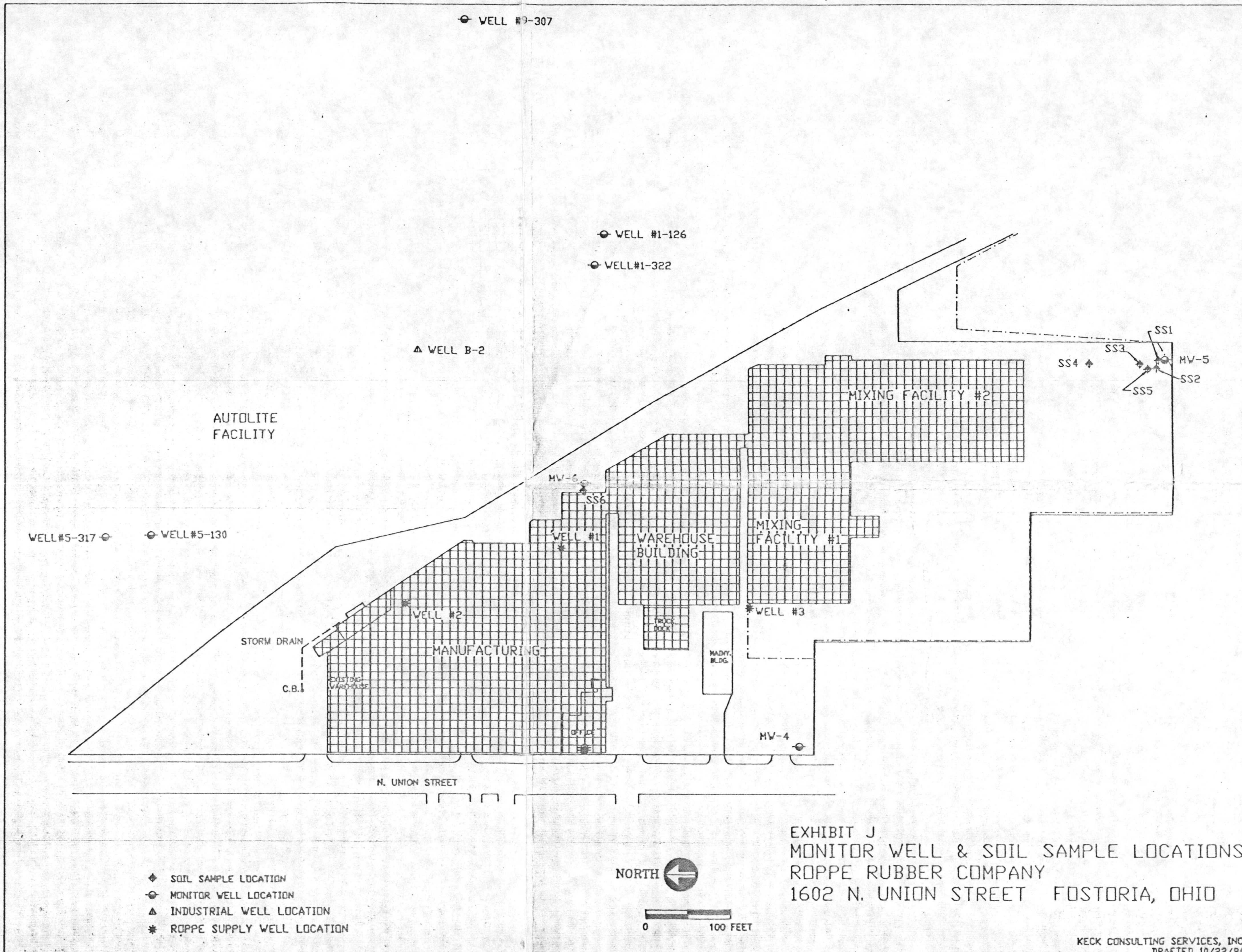


EXHIBIT J
MONITOR WELL & SOIL SAMPLE LOCATIONS
ROPPE RUBBER COMPANY
1602 N. UNION STREET FOSTORIA, OHIO

KECK CONSULTING SERVICES, INC.
DRAFTED 10/22/86